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COMPARATIVE STATISTICS

Comparative statistics are of much value if they are compiled according to the same formula or upon the same basis. They are very misleading if they are compiled by the use of rules which are different and conflicting. It is therefore necessary to bear in mind in all studies of comparative results that the essential factor of accuracy is obtained only by uniform methods, and that by so far as the rules of compilation depart from uniformity by just that proportion do the results misinform. We are speaking with particular reference to the danger of comparison of electric railway operations in various cities or localities without consideration of the varying methods that may be used in the compilation of the figures. Unfortunately complete uniformity has not yet been attained in electric railway accounting, and it is for this reason that the study of comparative statistics may permit conclusions that are not justified. Even where uniform methods are followed, however, as, for instance, in a state where the system of accounts is under the rigid supervision of a commission, there is room for erroneous conclusions if the conditions of operation in each instance are not taken into account. The existence of severe grades, the availability of streets in the central district for street railway operation, the construction of excess mileage which franchises compel the company to operate, local conditions affecting labor, and climatic influences are some of the factors which should be considered in a serious attempt to make deductions from comparative statistics that are intended to be wholly fair to the companies under consideration.

TERMINALS OF INTERURBAN ROADS

The question of terminals is one of the most serious problems of the interurban railway. Where one company owns both the interurban line and the franchises in its terminal cities its problem in this respect is simplified by the elimination of any difficulty about trackage rights and is reduced to the sole question of selection of a satisfactory location for a terminal station. Even in the case of such companies, however, it is apparent from a study of conditions in some of the interurban centers that the importance of a central location for the terminal station is not fully realized. Careful inspection justifies the statement that the ideal location for an interurban passenger terminal is typified by the station which accommodates the various lines entering Indianapolis from all directions. This station is convenient to the chief center of business and is one of the well-known sights of the city. The attraction and permanent retention of the passenger business that naturally belongs to the interurban line will be facilitated by the selection of a point of vantage from which the patrons of the road can "see and be seen." The selection of a well-located place for an interurban terminal requires a kind of business judgment that is akin to that of the successful buyer of real estate in congested centers. Just as such a man seeks the site where the crowds are, so the interurban official on whom the responsibility rests of selecting a permanent terminal location should look for it in the district which will best serve the convenience and comfort of the

traveling public. So long as interurban companies can reach the centers of large cities by the use of tracks laid on streets their terminal expenses will be relatively light, and they should not hamper themselves by poor locations for stations, because their development in passenger traffic will be affected by the degree of accessibility of their terminal facilities.

THE NEW DISPLACING THE OLD

One of the reasons why electric railway companies are loath to create new facilities rapidly to take the place of existing facilities is the lessening in value of old property which is likely to follow. With a manufacturing company which produces articles for sale improvements are advantageous because they tend to make a broader and quicker market for goods. An electric railway company, however, is dependent upon the sale of a transportation service, and the necessary large investment in plant is burdensome to carry unless most parts of it are more than self-supporting. It is, of course, idle to assert that each unit of car mile or track mile of an electric railway company should always yield a profit. There are always cars that will not meet their operating expenses in the course of the day, just as in the case of the urban railway of long-established position there is track mileage which the growth of the city or development of new and better methods of rapid transit render obsolete or of lessened investment value. If new facilities are provided before the track and car capacity have been used to the limit they merely displace some of the old property from its position of earning power. Such new facilities, therefore, in order to be thoroughly profitable adjuncts to the property as a whole, should pay more than the needed return on their actual cost in capitalization. When a subway, for instance, becomes part of the transit scheme of a city it is better that it should be owned by, and operated in conjunction with, the city railway system. The subway, if built wisely so as to serve the district of greatest density of population not adequately served by transit facilities, acquires traffic and earnings that would accrue otherwise to the existing lines which are rendered less valuable by the march of progress. In such cases the returns of all lines, old and new, when merged together, should show a profit on the total investment.

CONTROLLED COMPETITIVE LINES

The exact place which controlled electric railways will find eventually in the operating organization of steam railroads that have acquired competitive or feeder electric lines is one that it appears to be too early to fix. Electric railways have not been controlled in sufficient volume by steam railways for a period of time long enough to have all of the intimate relations worked out to a point where they can be regarded as permanent. Both the New York, New Haven & Hartford Railroad and the New York Central & Hudson River Railroad, which have controlled for years the largest amount of electric railway mileage dominated by steam railroad systems, have made many changes in their methods, both of organization and operation. The Southern Pacific Company, which has now become largely interested in both urban and interurban electric railway properties in the southern part of California, has announced a plan which shows its solution of the problem of distribution of traffic in one district in which the steam and electric lines were actually competitive. It has discontinued the operation of steam passenger trains between Los Angeles and Pasadena and the passenger traffic is carried entirely by the controlled Pacific Electric Railway. As part of the plan, the electrified Pasadena terminal of the steam railroad will be used for the electric cars. Freight of the Southern Pacific Company will still be carried by steam between Los Angeles and Pasadena. This is an excellent disposition of a somewhat vexatious matter and one that should be appreciated by the traveling public directly concerned. The electric service gives a much more enjoyable trip to travelers than the steam railroad with its annoying smoke, dust and cinders. The plan which has been developed by the Southern Pacific Company can be applied by other steam railroads controlling electric railways, and it has the economic advantages of conservation of investment, elimination of fruitless and wasteful competition and better service.

SOME USES OF TRAFFIC CURVES

Traffic curves may be turned to account in so many different ways that it is strange to find that so few companies compile them. It is true that to make a complete traffic count many watchers are required, and this usually means a large expense. But for a great many purposes such complete records are not necessary. Simpler observations of single lines made two or three times a year will often suffice. The use of such records is not generally to inform the management of the traffic conditions. At least on the smaller properties, they are usually unnecessary for this purpose. But they give to those outside the company tangible evidence of the extent to which the service is really being adjusted to meet the conditions peculiar to each line.

The simplest curve is one which shows the comparative numbers of passengers carried at different hours over individual lines. When placed before a citizens' grievance committee such curves will serve as an effective explanation for a longer headway or a higher fare on one route than on another which is of similar length but does a larger business. Curves of this kind can usually be prepared from the conductors' trip sheets. The compilation of data for curves showing seat use during rush hours, however, requires the employment of some extra men, because a conductor cannot count the number of seated and standing passengers at frequent intervals. Seat-use curves are of special value as a guide for planning short-line service.

Another valuable traffic curve is one which shows the relation between seat use and car spacing, measured by one-minute intervals. The traffic operator knows how difficult it is to maintain even a semblance of the uniform headway proposed by the schedule if the line is subject to blockades from vehicle traffic. Since a curve of this character readily indicates the irregular spacing of cars over a given route, it is a potent argument in favor of traffic regulation by the police at busy intersections. This curve also

helps to show the close relation between unequal loading and irregular headways of the cars, because, no matter how frequent the schedule is, many persons will insist upon boarding the first car available after a block, although it may be followed closely by many almost empty cars. A condition like this is most easily proved graphically by a chart which shows that the public is not making the most advantageous use of the facilities offered.

THE NEW YORK, WESTCHESTER & BOSTON RAILWAY

The early opening of the New York, Westchester & Boston Railway, which is described elsewhere in this issue, will mark the completion of a heavy electric traction system which takes a place as the most important single-phase suburban railway in the United States equipped for high-speed service with multiple-unit cars. The new line benefits the city of New York and Westchester County by opening opportunities for suburban development north of Manhattan Island, supplementing the over-river communities in New Jersey and on Long Island. While this aspect of the new railway is of local importance, the engineer and operator will be especially interested in the splendid construction and equipment standards of the system.

The most striking technical feature is the application of high-tension single-phase current for multiple-unit train service. This fact in itself, without regard to economic considerations, shows how rapidly the design of single-phase car equipment has advanced, for five years ago many engineers were unwilling to concede that it could be adapted for high-speed multiple-unit service. In the meantime, however, the favorable experiences on the pioneer Hamburg-Altona-Blankenese line in Germany and on the New York, New Haven & Hartford Railroad in this country removed the question of reliability from the region of controversy. The selection of single-phase instead of direct-current operation was not due to any immediate saving. In fact, the analyses of comparative installation and operating costs showed surprisingly small differences when applied to the mileage under consideration. Although part of the line is in New York City, direct-current service was not necessary, because the cars are to run over the right-of-way owned by the company and are not intended to operate over existing city railways. On the other hand, it appeared that the single-phase system would prove cheaper for the ultimate mileage of the New York, Westchester & Boston system, besides permitting a certain degree of uniformity and interchangeability with the equipment of the New York, New Haven & Hartford Railroad, which is the controlling company. Under these circumstances it was natural to decide in favor of single-phase.

The overhead construction of the new line, which will be described in detail in a later article, represents the experiences of the engineers who have had charge of the New Haven electrification. The catenary bridges have been made much lighter and cheaper without any sacrifice in safety, while the two types of catenary suspension also are of simpler form than the original New Haven designs. The illustrations in the article published in this issue reveal the remarkable preparations which the builders of this railway have made for future development along the route. Thus the section between the New York terminal and Mount Vernon is a four-track line, with most elaborate signal protection, while the many bridges and viaducts throughout the system are built in accordance with the authorized final grades and roadway. The fireproof passenger stations and platforms are of the most artistic character and show clearly the ambition of the builders to make this railway combine beauty and utility in a degree hitherto unknown in American electric railway or steam railway practice.

It is not necessary to add to the description an account of the many striking features of the rolling stock, as these were covered so fully in the ELECTRIC RAILWAY JOURNAL for March 30, 1912. In connection with the traffic operation of the railway, however, attention may be called to the system of 5-cent fare zones with colored tickets for each zone. This novel method was adopted to avoid the annoyance of ticket inspection during the trip of the passenger.

THE OUNCE OF PREVENTION

Constant observation of operating conditions is necessary in order to avoid accidents in the car service, and there probably will never be a time in street railway work when keen and exacting supervision of the handling of traffic will be safely relaxed. Fortunately the cost of safeguarding the service is small in proportion to the good accomplished.

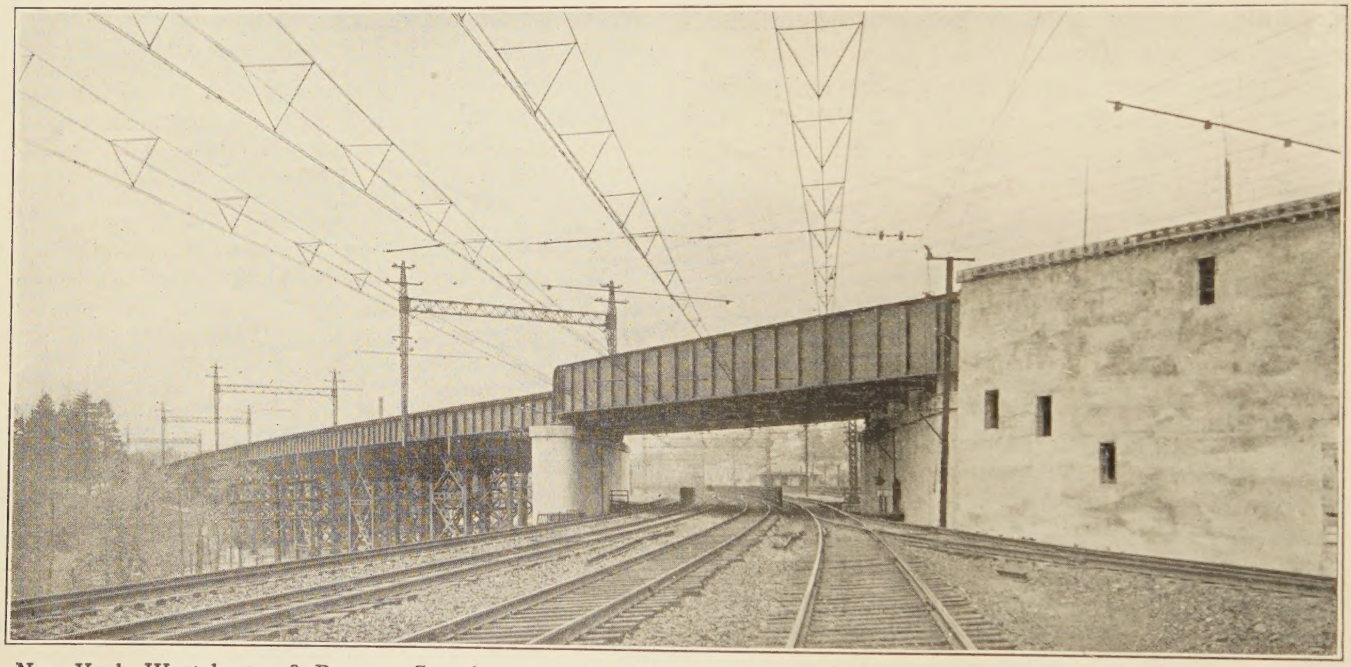
On some systems there is room for improvement in the handling of work cars, for example. Common sense would appear to render needless advice regarding the stowing away of material so as to avoid projection beyond a safe overhang on curves, but too much care cannot be taken to see that all materials and supplies carried are fastened securely to the car or are placed so that rolling off is impossible. The practice of pulling bare trucks over the tracks through crowded streets is open to some objection. It tends to slow down the speed of the service car to a rate which invites congestion and lost time, increasing the cost of maintaining passenger schedules, and on sharp curves the low-lying truck, or string of trucks, invites accident to pedestrians, who are not always careful about crossing a track after a motor car passes. The least that a company can do where the haulage of trucks seems necessary is to attach a red flag by day and a red lantern at night to each side of each track, so that the man in the street shall not be tripped up and perhaps run over through his failure to realize that a truck is following the motor car. Box cars in poor order are found oftener on steam railroads than on electric railways, but the increasing amount of freight and express traffic renders it important to operate cars only upon the best possible basis. A loose door falling to the street or swinging against a passing car running at high speed is capable of producing in damages literally thousands of times the cost involved by its prompt repair.

In the future it is to be hoped that companies receiving freight or express cars from others will take a firm stand against operating any defective rolling stock, and that broad arrangements can be made at least for emergency repairs and subsequent remitted bills for the cost of the work to all car owners, whether these are represented by steam or electric railway interests.

The New York, Westchester & Boston Railway

An Account of the Franchise History of This New Single-Phase Suburban Railway, of the Territory Which It Serves, of Its Relation to Previously Established Transit Lines, of the Character of Train Service Which It Gives and of the Method of Fare Collection

The New York, Westchester & Boston Railway, which will begin operation on May 29 in the borough of the Bronx, New York, and through Westchester County, over the routes indicated in the accompanying map, is unique as the first heavy electric traction system in the East which is neither an electrification of a steam railroad nor an extension of an ordinary direct-current city system. It presents the novel condition of a single-phase suburban railroad of the most massive construction, built through what is practically virgin territory and with right-of-way facilities to satisfy the heaviest traffic demands that are likely to arise from more than a generation of rapid growth. The construction of the road along such broad, far-sighted lines could hardly have been undertaken by any organization other than one which could afford to dispense with an immediate profit on its investment. Thus, despite many years of promotion, no important building was undertaken until interests identified with the New York, New Haven & Hartford Railroad had secured possession of the franchise rights as hereinafter described.



New York, Westchester & Boston—Crossing Over the Electrified Section of the New York, New Haven & Hartford Railroad

ROUTE

The new line passes through the sparsely settled territory of the northern part of Bronx Borough. Beyond this section it is in touch with many important towns and villages of Westchester County which are served by the New York, New Haven & Hartford Railroad's main line and Harlem River branch and by the New York Central & Hudson River Railroad's main line, Putnam and Harlem divisions. However, the routes of the New York, Westchester & Boston Railway were so laid out that in communities which already had railroad service the stations of the new line were placed at the opposite end of the town to foster the growth of entirely new business. The new Westchester system, as now built, consists of the main line from Harlem River, borough of the Bronx, New York, to North Avenue, New Rochelle, a distance of 12.23 miles, and a branch from Columbus Avenue, Mount Vernon, to Westchester Avenue, White Plains, Westchester County, a distance of 8.6 miles. Eventually the main line will extend to Port Chester, N. Y., and the proposed Westchester Northern Railroad will form a through line from White Plains to Brewster, N. Y., and Danbury, Conn. In general, the rapid transit routes in Westchester County run north and south and are owned or controlled by the New Haven and New York Central Railroads, while cross-country connections are afforded by electric railways which operate cars of city type.

FRANCHISE HISTORY AND TERMS

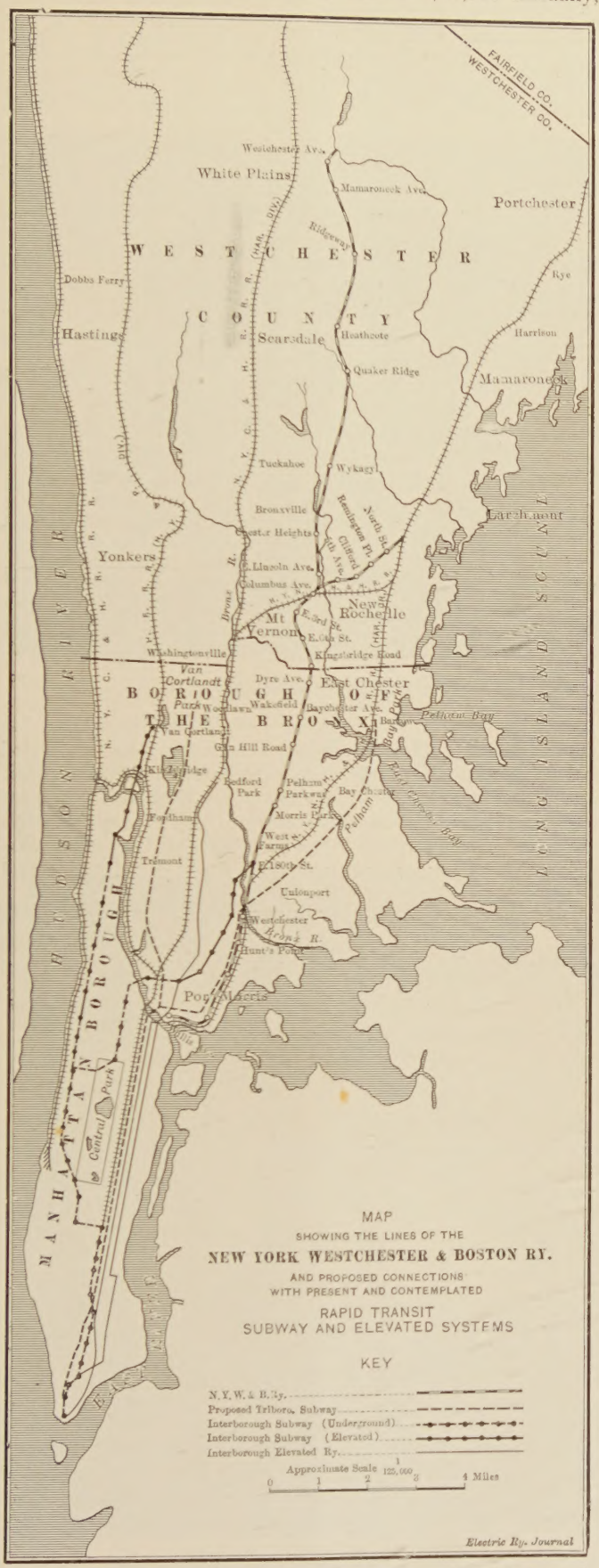
The New York, Westchester & Boston Railway Company was incorporated under the laws of the State of New York on March 20, 1872. The original route under its charter was from the Harlem River to Port Chester, N. Y., with two branches, one from the main line near what is now 177th Street in the borough of the Bronx to Throg's Neck, the other from Mount Vernon to Elmsford, N. Y.

The New York & Port Chester Railroad Company was incorporated in New York on April 3, 1901.

By act of Legislature in 1909 the consolidation of these companies was authorized, as was also the right to abandon the portion of the White Plains Branch of the Westchester Company between White Plains and Elmsford, N. Y., and the portion of the Throg's Neck Branch from Clason Point to Throg's Neck, subject to the approval of the Public Service Commissions of the First and Second Districts. These bodies approved the consolidation of the two companies and the abandonment of the White Plains-Elmsford line, but denied the petition for the right to abandon the Throg's Neck branch. On Jan. 19, 1910, the properties of both companies were merged into a new company called the New York, Westchester & Boston Railway Company, the capital stock of which is $5,000,000 and the total new mortgage $60,000,000. Of the latter the total authorized issue is $20,100,000. The ownership of the road lies wholly with the New York, New Haven & Hartford Railroad.

The New York City franchise was granted to the com-

pany on Aug. 2, 1904. Under its terms the company is to pay during the first ten years $8,000 annually and during the succeeding fifteen years the sum of $16,000 annually,



New York, Westchester & Boston—Map of Rapid Transit Lines in Manhattan, Bronx and Westchester County

and beginning with the operation of any portion of the railway until the end of the first ten years an additional sum of 40 cents per linear foot for each line of single track within the lines of all legally open streets in use, and for the succeeding fifteen years 80 cents per annum in lieu of the 40 cents. The company is to construct for the accommodation of local passengers at least six stations between the Harlem and Bronx Rivers and at least four stations between the Bronx River and the city line and be obligated to run on the main line at least sixty trains in either direction daily. At no time either day or night must the headway be greater than thirty minutes, except that during the first five years after the commencement of operation trains are not required to run between the hours of 1 a. m. and 4 a. m. unless otherwise directed by the Board of Estimate and Apportionment. During the first twenty-five years the fare within the city limits must not exceed 5 cents for one continuous ride to any point on the railway to any other point thereon or branch or connection thereof.

The line from the Harlem River to 174th Street uses under a perpetual lease the tracks of the Harlem River branch of the New Haven Company. At 174th Street the tracks diverge from those of that company running northwestwardly across successively 180th Street, Pelham Parkway, Gun Hill Road, East 222d Street, Baychester Avenue, Boston Post Road and Dyre Avenue, reaching the New York City line and entering the limits of Mount Vernon just beyond the latter point. From there the route lies through Mount Vernon, crossing East Sixth Street and East Third Street to Columbus Avenue, where it passes over the New Haven main line and at which point the White Plains branch diverges, the main line continuing on the northwesterly side of the New Haven road through North Pelham, crossing Fifth Avenue, into New Rochelle, crossing Clifford, Webster and North Avenues and reaching another point of connection with the New Haven main line at the eastern end of New Rochelle, from which point it is practically parallel to the main line of the New Haven Railroad through Larchmont, Mamaroneck, Harrison and Rye to Port Chester. The White Plains branch, diverging from the main line at Columbus Avenue, crosses East Lincoln Avenue in Mount Vernon and, passing through the extreme western bounds of New Rochelle over North Avenue, passes through Scarsdale, crossing Quaker Ridge Road, Palmer Avenue, Ridgeway Road and Mamaroneck Avenue to White Plains.

CHARACTER AND POPULATION OF TERRITORY SERVED

The new road will serve a great area of most attractive residential territory which hitherto has been too isolated from the metropolitan district to enjoy any considerable development. Much of this land is several hundred feet above sea level and from a hygienic point of view is exceptionally adapted to the requirements of home builders. The prospect for the growth and development of the territory through which the road passes probably can be best indicated by the statistics which show its progress in the past and foreshadow what may be looked for in the future under the very greatly improved conditions brought about by the building of the New York, Westchester & Boston Railway.

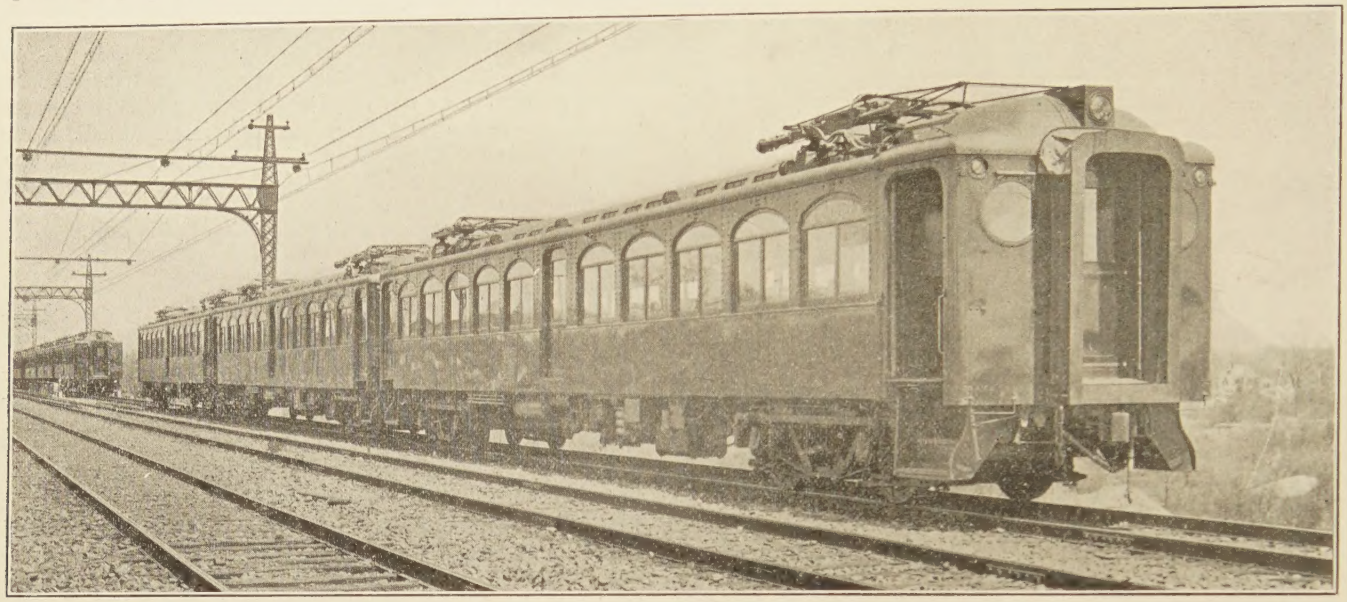
The total population of the borough of the Bronx in 1900 was 200,507. In 1910 its population had grown to 430,980, an increase of over 114 per cent. In 1900 the assessed value of its real estate was $138,494,849. In 1910 it had increased to $464,704,008, an increase of over 234 per cent. In 1911 the assessed valuation had risen to $603,488,112. A very considerable proportion of this last increase was due no doubt to the increased value brought about by the fact that the railway was under construction. It is believed by experienced judges that within another decade the population of the borough of the Bronx will be about 1,000,000.

The city of Mount Vernon increased in population during the last decade 45 per cent. The town of Pelham increased 91 per cent, and during the same period the popu-

lation of New Rochelle increased 96 per cent, that of Scarsdale 47 per cent and that of White Plains 102 per cent. The assessed valuations of the cities named all show increases in the valuation of real estate on the same large ratio. While statistics are not available for other towns along the main line, it is known that the increases in their population and assessed valuation have been of the same generous proportions. The increases in the population of the principal communities in Westchester County are shown in the table in the next column.

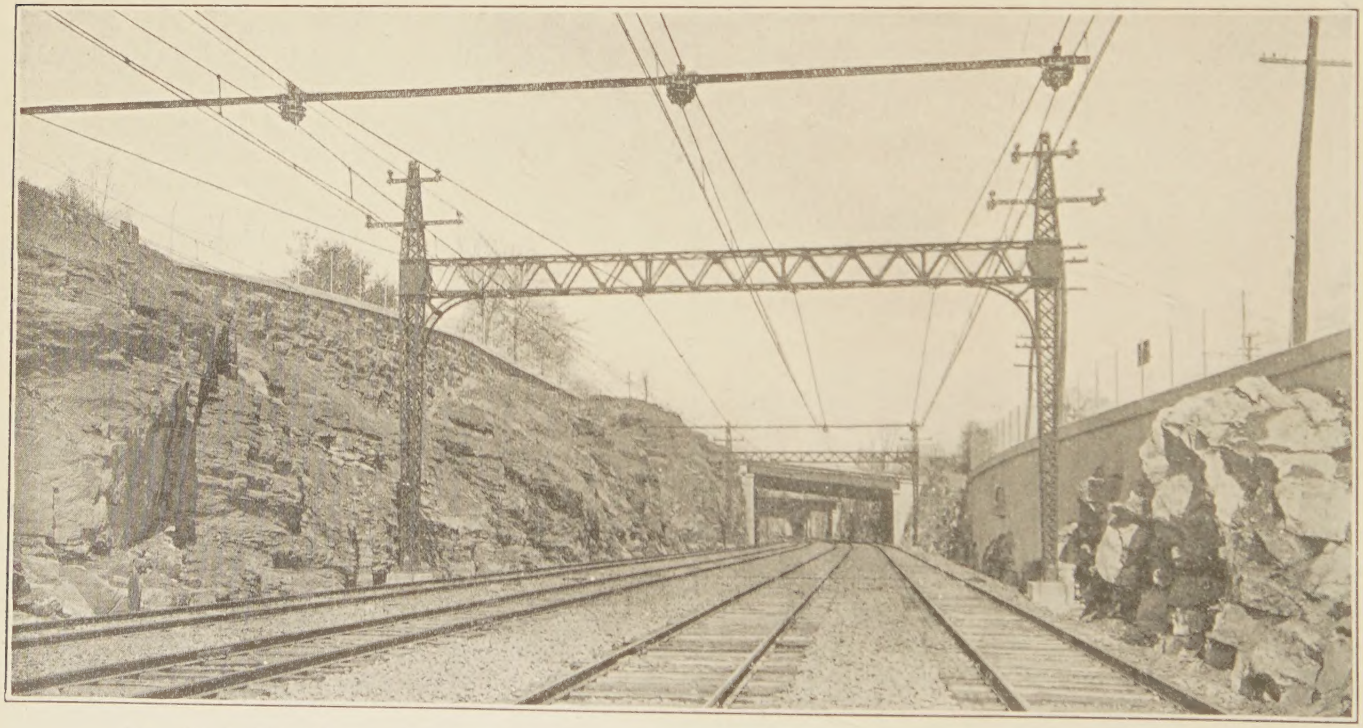
Increase in the Population of Westchester County Communities

	1900.	1910.
Mount Vernon	21,228	30,919
New Rochelle	14,720	28,868
Eastchester	3,040	6,422
Harrison	2,048	4,226
Mamaroneck	3,849	6,602
Pelham	1,571	2,998
Rye	12,861	19,652
Scarsdale	885	1,300
White Plains	7,869	15,949
Increase, 46,865, 66.2 per cent		
Totals	68,071	116,936



New York, Westchester & Boston—Single-Phase Trains Ready for Service

A great number of very large and most attractive real estate developments have already been opened and improved for settlement. Many others are projected, the lot values in which vary from prices for the modest home of the laborer to suburban villas of the highest type.



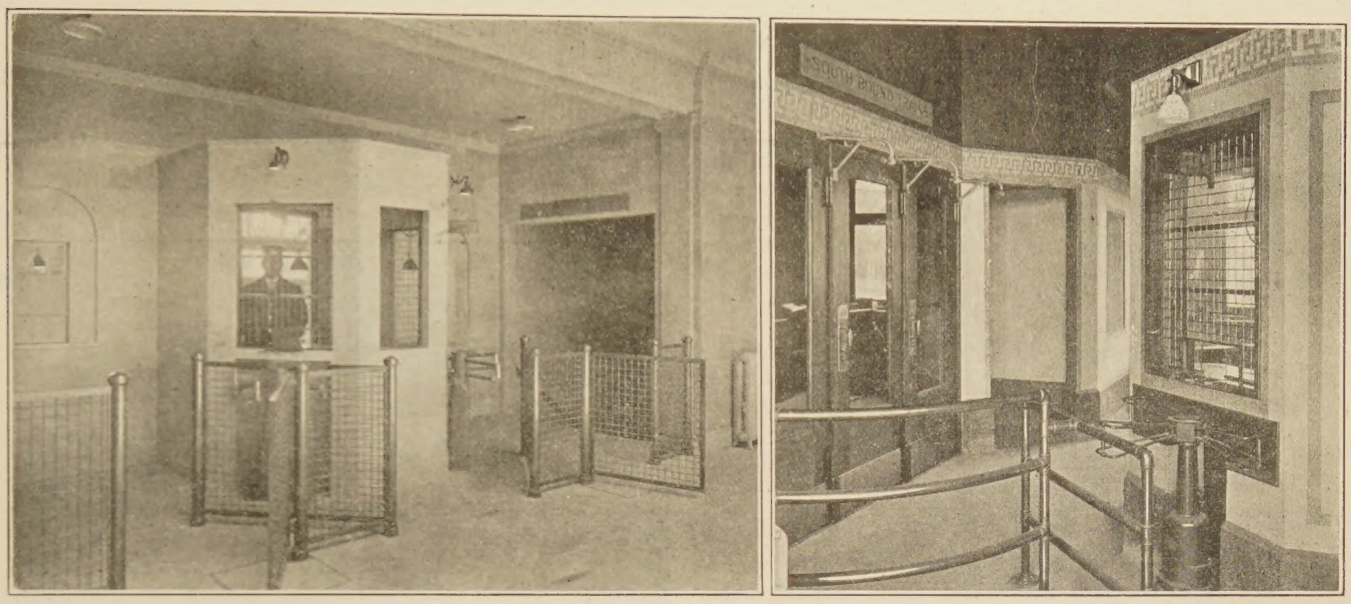
New York, Westchester & Boston—A Deep Rock Cut on the Four-Track Section, Mount Vernon

NEW YORK TERMINALS

The New York City terminal of the road will be at the same point as that of the Harlem River Branch of the New York, New Haven & Hartford road at Harlem River, where direct connection will be made with the elevated lines. A comprehensive transfer station, however, is being erected at 180th Street, to which the Interborough Rapid Transit Company is to extend the elevated section of its present subway line and the express service of its Third and Second Avenue elevated roads when third-tracked for that purpose. This transfer station, which will be 200 ft. wide and 560 ft. long, will be utilized by the Interborough and Westchester companies for the interchange of traffic. It will also be used by the proposed White Plains Road branch of the Interborough Company and is so designed that it may

be used by the triborough subway now under construction by the city of New York. The successful completion of these various lines will give quick and effective distribution of Westchester passengers to the particular points in Manhattan which they may desire to reach and will add greatly to city and suburban transit facilities.

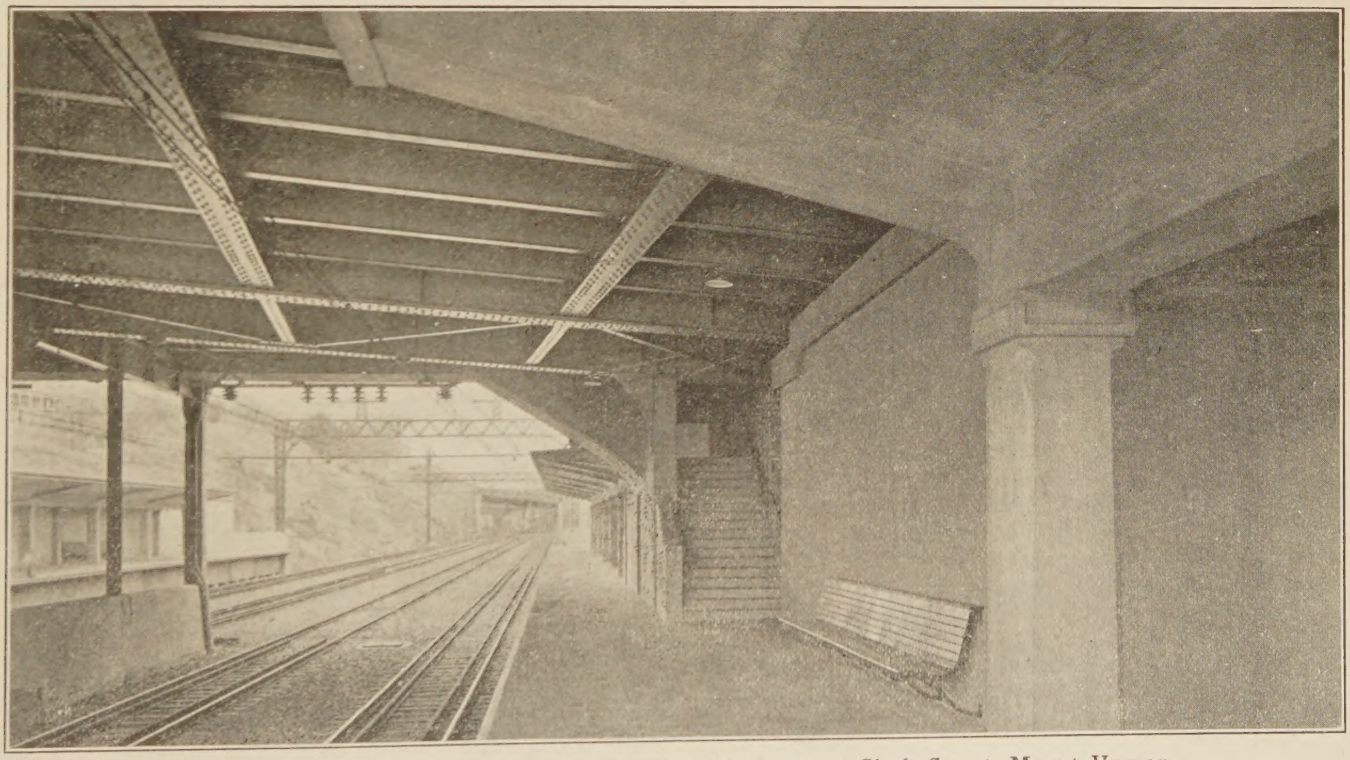
It should be explained that, in view of the franchise condition which restricts the Westchester company to the collection of but one 5-cent fare for a ride within the city of New York, it would have been financially impracticable to carry passengers further than the northern terminals of existing city lines. Studies made by L. B. Stillwell of all transit facilities within the suburban zone of New York showed that there was not a single line which did not require that most of its passengers should transfer at least once in order to reach New York, and furthermore that any given town on the Westchester line with the city connections previously mentioned would be nearer to the New York City Hall in point of time than any other equally distant town on any other railway.



New York, Westchester & Boston—Ticket Office, Turnstiles and Stairways at Third Street and Sixth Street Stations, Mount Vernon

STATION LOCATIONS

The stations of the road in the borough of the Bronx are located at 180th Street, Morris Park, Pelham Parkway, Gun Hill Road, Baychester Avenue and Dyre Avenue; in Mount Vernon at Kingsbridge Road, East Sixth Street, East Third Street, Columbus Avenue; in Pelham at Fifth Avenue, and in New Rochelle at Clifford, Webster and North Avenues. The other stations between New Rochelle and Port Chester on the main line have not yet been definitely located. On the White Plains division after passing Columbus Avenue there will be a station in Mount Vernon at East Lincoln Avenue and one in Eastchester at Chester Heights, and there will be stations in the northern part of New Rochelle at Wykagyl and Quaker Ridge, in



New York, Westchester & Boston—Station Platforms at Sixth Street, Mount Vernon

Scarsdale at Heathcote, and in White Plains at Ridgeway Road, Mamaroneck Avenue and Westchester Avenue, the last station being the terminal of the division and the connecting and transfer point with the Westchester Northern Railroad when the latter road is constructed.

ULTIMATE TRAIN SERVICE

As previously noted, the minimum number of trains and the longest permissible headway are fixed chiefly by the franchise requirements of the city of New York. These requirements stipulate that there shall be sixty trains a day each way on the main line, making all station stops (locals); that the maximum headway allowed between such local trains shall be thirty minutes, and that during the first five years of operation service between 1 a. m. and 4 a. m. is not required. In addition, the city of Mount Vernon has stipulated that at least fifty trains per day each way must be operated between Mount Vernon and New York. The initial schedule is based on meeting these franchise requirements in regard to the local service besides providing an express service to alternate with the local service on the same headway.

All locals and expresses, in each direction, to alternate branches meet at the East Third Street station, Mount Vernon, to transfer passengers; that is, all New Rochelle locals meet White Plains expresses at this point and vice versa. Each branch service thus supplements the service of the other branch. It is, therefore, possible to give on each branch a ten-minute express service to New York, with through expresses on a twenty-minute headway, combined with a local express service on a twenty-minute headway. Owing to the fact that this common meeting point lies so near the Columbus Avenue junction, it has been necessary to make this junction operate with great speed as regards switches and signals. The rush hours were assumed to be equivalent to those of the New York subway, allowing for the difference in running time from downtown districts. The arrival rush period at the 180th Street transfer station has been assumed between 7:20 a. m. and 9:20 a. m., equivalent to 8 a. m. to 10 a. m. at Brooklyn Bridge, and the leaving rush hours from 5 to 7 p. m., equivalent to 4:20 p. m. to 6:20 p. m. at Brooklyn Bridge.

PRELIMINARY TRAIN SERVICE

For the preliminary service express and local trains are to be operated between 180th Street and North Avenue, New Rochelle, on the east. The train service, which is to some extent experimental with a view to developing the amount of passenger traffic, is to be as follows:

South-bound express trains leave East Third Street, Mount Vernon, every twenty minutes, stopping at Pelham Parkway and 180th Street. Local trains leave East Third Street every twenty minutes, making all stops to 180th Street.

Express trains to the north leave East Third Street every forty minutes for North Avenue, New Rochelle, and local trains for North Avenue also run at 40-minute intervals.

PROPOSED FULL-LINE SERVICE

The regular service will call for a fifteen-minute headway for both express and local trains on each branch. This will give a headway of seven and one-half minutes for both the express and local trains on the four-track section between New York and Mount Vernon. It is planned to run on the same headway practically all day long both on weekdays and holidays.

SCHEDULES

In preparing the schedules it was planned that the local trains were to consist of one car each and express trains of three cars each. All straight passenger rolling stock consists of center and end-door motor cars as described in the Electric Railway Journal for March 30, 1912, which seat seventy-eight passengers each. The local stops were assumed at fifteen seconds each and the express stops at twenty-five seconds each.

RUNNING TIMES

The running times of express and local trains on the two divisions have been calculated as follows:

(A) White Plains Express Service—180th Street to White Plains

	Distance, Miles	Time of Run Min.	Sec.	Time and Stop Min.	Sec.
180th Street to Pelham Parkway	1.525	2	54	3	19
Pelham Parkway to East Third Street	3.871	5	25	5	50
East Third Street to Wykagyl	3.187	5	05	5	30
Wykagyl to Heathcote	2.927	4	41	5	06
Heathcote to White Plains	3.570	5	05	5	05
180th Street to White Plains	15.080	..	..	24	50

(B) New Rochelle Express Service—180th Street to New Rochelle

	Distance, Miles	Time of Run Min.	Sec.	Time and Stop Min.	Sec.
180th Street to Pelham Parkway	1.525	2	54	3	19
Pelham Parkway to East Third Street	3.871	5	25	5	50
East Third Street to New Rochelle (North Street)	2.379	4	33	4	35
180th Street to New Rochelle	7.775	..	..	13	04

New York, Westchester & Boston—Entrance and Facade of Third Street Station, Mount Vernon

(C) White Plains Local Service—180th Street to White Plains

	Distance, Miles	Time of Run Min.	Sec.	Time and Stop Min.	Sec.
180th Street to Morris Park	1.134	2	28	2	43
Morris Park to Pelham Parkway	0.389	1	20	1	35
Pelham Parkway to Gun Hill Road	0.891	2	04	2	19
Gun Hill Road to Baychester Avenue	0.762	1	51	2	06
Baychester Avenue to Dyre Avenue	0.769	1	44	1	59
Dyre Avenue to Kingsbridge Road	0.295	1	05	1	20
Kingsbridge Road to East Sixth Street	0.608	1	43	1	58
East Sixth Street to East Third Street	0.546	1	40	1	55
East Third Street to Columbus Avenue	0.499	1	30	1	45
Columbus Avenue to Lincoln Avenue	0.372	1	11	1	26
Lincoln Avenue to Chester Heights	0.932	2	08	2	23
Chester Heights to Wykagyl	1.384	2	45	4	00
Wykagyl to Quaker Ridge	2.067	3	45	4	00
Quaker Ridge to Heathcote	0.860	2	06	2	21
Heathcote to Ridgeway	1.561	3	01	3	16
Ridgeway to Mamaroneck Avenue	1.379	2	37	2	52
Mamaroneck Avenue to Westchester Avenue	0.630	1	38	1	38
180th Street to White Plains	15.080	34	36	38	36

(D) New Rochelle Local Service—180th Street to New Rochelle.

	Distance, Miles	Time of Run Min.	Sec.	Time and Stop Min.	Sec.
180th Street to Morris Park	1.134	2	28	2	43
Morris Park to Pelham Parkway	0.389	1	20	1	35
Pelham Parkway to Gun Hill Road	0.891	2	04	2	19
Gun Hill Road to Baychester Avenue	0.762	1	51	2	06
Baychester Avenue to Dyre Avenue	0.769	1	44	1	59
Dyre Avenue to Kingsbridge Road	0.295	1	05	1	20
Kingsbridge Road to East Sixth Street	0.608	1	43	1	58
East Sixth Street to East Third Street	0.546	1	40	1	55
East Third Street to Columbus Avenue	0.499	1	30	1	45
Columbus Avenue to Fifth Avenue (Pelham)	0.634	1	36	2	11
Fifth Avenue to Storer Avenue	0.327	1	12	1	27
Storer Avenue to Webster Avenue	0.416	1	28	1	43
Webster Avenue to North Avenue (N. R.)	0.503	1	25	1	25
180th Street to New Rochelle	7.775	21	26	24	26

It will be observed from the foregoing tables that on the White Plains division the distance between the express stations ranges from 1.525 miles to 3.875 miles, and that the schedule speed of the express trains is 36.5 m.p.h.; while on the New Rochelle division the schedule speed is 34 m.p.h. The distance between local stations on the White Plains division ranges from 0.295 mile to 2.072 miles and the schedule speed is 23.5 m.p.h. Similarly on the New Rochelle division the distance between local stations varies from 0.295 mile to 1.134 miles and the schedule speed is 19.1 m.p.h.

FARES AND FARE COLLECTION

The single-trip fares on the New York, Westchester & Boston Railway are based upon the 5-cent zone system. There are eight zones in all. The longest zone is that between the Harlem River terminal and Dyre Avenue within the limits of New York, a distance of 8.39 miles. This length, of course, was determined by the franchise conditions. The cost of the 20-mile trip to White Plains is 35 cents. Sixty-ride commutation books between the zones hereinafter named and the Harlem River terminal are sold at the following rates: Mount Vernon, $5 for 10.72 miles; Fifth Avenue, Pelham, $5.25 for 11.01 miles; New Rochelle, $5.50 for 12.23 miles; Wykagyl, $5.50 for 13.07 miles; Heathcote, $7 for 16.01 miles, and White Plains, $8 for 19.56 miles.

The zone system of fare collection has been so devised that the passenger, whether occasional or commuting, will not be asked to show his ticket during the entire trip. For example, a person who enters the East Third Street station at Mount Vernon receives for 10 cents a ticket which is marked as good to any station within the New York zone. As he passes through the turnstile his ticket is mutilated with a punch peculiar to the Mount Vernon zone. The ticket holder then boards the train, but does not give up his ticket until he deposits it in a ticket chopper's box at the station of departure. In like manner the commuter has his commutation ticket punched at the entering station and viséd by the ticket chopper at the leaving station. Although this method of ticket fare collection is novel in American electric railway practice, it is in common use on the underground railways of London and Berlin. As shown in the accompanying reproductions, only two styles of tickets are necessary for each zone, one reading "Between Stations in ..... Zone Only" and the other reading "Any Station in ..... (issuing) Zone to Any Station in ..... (terminating) Zone." Owing to the small number of zones, it has

New York, Westchester and Boston Railway Company.

Notice to Passengers.

Passengers are not required to show tickets on trains.

Retain ticket as it must be dropped in box when leaving destination station.

Commutation Tickets must be punched by Ticket Agent before turnstile is released, and shown to Guard at Exit.

New York, Westchester & Boston—Directions for Passengers Regarding the Use of Trip and Commutation Tickets

been found feasible to adopt a distinctive ticket color for each. Thus only red tickets are good for a ride either between stations in the New York zone itself or from any other zone to stations in the New York zone. This means that every ticket surrendered for a ride at a station in the New York zone must be red. Consequently, the ticket chopper can detect over-riding of zones much more easily than if he had to read the lettering as is done by the ticket receivers on the Berlin and London lines. Each ticket agent is therefore provided with only one ticket for each of the eight zones, except for the two-color ticket hereinafter noted. The zones and corresponding colors are as follows: New York, red; Mount Vernon, green; Wykagyl, pink; Quaker Ridge, blue; Heathcote, yellow; Ridgeway, lavender; White Plains, white, and New Rochelle, gray. A two-color ticket is also issued to cover a 5-cent ride two

NEW YORK, WESTCHESTER & BOSTON RY CO.
Good For One Continuous Passage Without Baggage From
Any Station in New York Zone to
Any Station in Wykagyl Zone
Form 16 H
NEW YORK, WESTCHESTER & BOSTON RY CO.
Good For One Continuous Passage Without Baggage
BETWEEN STATIONS IN
WYKAGYL 7 NE ONLY
Form 4 Q

New York, Westchester & Boston—Tickets for Inter-Zone and Intra-Zone Riding

stations in length when the stations are in different zones. The colors used are those of the adjoining zones.

Another wise step taken by the company to please its patrons has been the distribution of a booklet to its trainmen which will enable the latter to answer questions regarding the railway service and the geography of the territory. It is especially desirable that the trainmen should have accurate information concerning locations and distances of the thoroughfares in each community owing to the large number of new or similar names introduced by the many realty development companies.

BAGGAGE BUSINESS

According to the present plans of the company, baggage transportation will be purely interstation and will be limited to such personal belongings of passengers as baggage, tool chests, baby carriages, etc. This baggage will be carried only upon certain trains. Room for baggage handling has been provided at the following stations: 129th Street and 180th Street, New York; East Third Street, Mount Vernon; Chester Heights, Wykagyl, Quaker Ridge, Heathcote and Westchester Avenue, White Plains. The ticket agents will sell baggage checks at a minimum rate of 10 cents for baggage up to 150 lb.

MR. INSULL ON CENTRAL POWER SUPPLY

The first of the series of addresses on Chicago transportation problems, begun by the City Club of Chicago, was held at 1 p. m. in the auditorium of the club on May 23. The subject was "Supplying the Energy Requirements of a Community" and the speaker was Samuel Insull, president of the Commonwealth Edison Company of Chicago. Mr. Insull described in a very interesting way the growth of the Commonwealth Company since 1887. The discussion was illustrated with lantern slides showing the increase in the sizes of the generating units from 160 kw in 1887 to 20,000 kw in 1911.

Curves were presented showing the conservation in coal consumption per kilowatt-hour since 1901, and the saving estimated due to this greater efficiency in conversion amounted to over 1,480,000 tons of coal in ten years. This has reduced the cost of current to the consumer nine times since 1886. It was shown that the taxes of the company had increased in the meantime from $6,000 in 1889 to $1,057,500 in 1911. The amount charged for fuel per year had increased from $8,860 to $1,500,000 during the same period. The relation of the light and power income and the distribution of the operating expenses were also shown in diagrams.

The gross income of all city public service companies in Chicago in 1911 was shown to be $82,000,000 on an investment of between $450,000,000 and $500,000,000. Mr. Insull said he knew of no place where the results obtained were so good, based on the total investment, as in Chicago.

Springfield Meeting of the Illinois Electric Railways Association

Discussion on Report of the Block Signal Committee Takes Up the Business Session—Trip Over the Illinois Traction System Affords Opportunity for Inspection of Signal Installation of That Company

About thirty members of the Illinois Electric Railways Association attended a meeting held at Springfield, Ill., on May 18. The chief topic discussed at the meeting was block signals. President E. C. Faber called the meeting to order at 11 o'clock and after the reading of the minutes by E. F. Gould, of Wheaton, who had been elected temporary secretary because of the enforced absence of C. E. Flenner, secretary of the association, the regular order of business was followed. Frank E. Johnson, Ohio Brass Company, chairman of the membership committee, reported on ten new members, who were admitted to the association by vote. With this additional membership, there remain very few roads in the State that are not now connected with this association.

REPORT OF THE BLOCK SIGNAL COMMITTEE

John Leisenring, signal engineer Illinois Traction System, chairman of the block signal committee, read the report of that committee, which will be found in abstract on page 871. In a vote of thanks which was given the committee, the association instructed it to continue the investigation of block signals and to amplify its report by the addition of cost data for typical signal block arrangements.

When questioned, Mr. Leisenring said that the use of light signals in place of semaphores would probably reduce the first cost on some roads in the neighborhood of 30 per cent. It was very difficult to set down with any degree of correctness figures of block signal cost—that is, for automatic track circuit block signals—which would be general in application. This was because the local conditions played such an important part in the arrangement of the individual signals and because the manufacturers of these signals were now working out simplified arrangements that brought about increased or decreased first cost.

H. E. Chubbuck, vice-president executive Illinois Traction System, described the methods followed in planning and purchasing the automatic track-circuit block signal protection which is now in operation on that road. The first proposals obtained were based on the block units—that is to say, the comparative cost of one company's apparatus against that of another for the protection of a block of certain length. Afterward it was found that the individual blocks on the system varied so greatly that the block unit was not a correct basis on which to estimate. Accordingly, figures were obtained on the cost of pieces of apparatus necessary for certain parts of the work. These figures, of course, did not include the cost of the signal control wire linework and the installation work. These were estimated separately on the entire job.

Garrett T. Seely, assistant general manager Chicago Elevated Railways, mentioned the electro-pneumatic automatic block signals on the South Side Elevated Railroad in Chicago, and said that if the committee was interested in having the costs on this installation the figures would be available for the use of the committee and other association members who might also be interested.

Mr. Chubbuck again called attention to the great variation in installation cost which might be expected because of the difference in the lengths of blocks, conditions of pole line, sidings and variations in the cost of labor.

On motion of Mr. Chubbuck, the association instructed the block signal committee to plan an inspection trip to view the Simmen automatic signal and dispatching system installed on the Indianapolis & Cincinnati Traction Company's property, provided that such a trip would be agreeable to C. L. Henry, president of that road. It was also suggested that if the trip should be made information regarding the date might be given to the managers of the Illinois companies in order that they might accompany the committee or send representatives to inspect this system of signaling.

INSPECTION TRIP OVER ILLINOIS TRACTION SYSTEM

A feature of this meeting was an inspection trip over the northern division of the Illinois Traction System. The members of the association were the guests of the officials of the road and were accompanied on a trip of nearly 200 miles, taken in the office car of Mr. Chubbuck, by C. F. Handshy, George Quackenbush, John Leisenring, Fred Buffe and W. H. Creviston.

The party started at Peoria at 8:30 a.m. and traveled over the Peoria-Springfield division in the morning before the meeting was held at Springfield.

This division is the first on which the Illinois Traction System installed automatic block signals, and the operation of these signals was watched with interest by the members of the party.

At the signal protecting east-bound movements at the Peoria & Pekin Union Railway crossing several runs were made to demonstrate the operation of a new automatic train stop which has been fitted to that signal and to the office car in which the party made the trip. First the signal was set purposely at stop and the motorman was instructed to run by it. As he passed, the automatic device performed its function of opening the train line and bringing the car to a stop.

The signal department of the Illinois Traction System has conducted experiments with the new automatic stop device, built by the Union Switch & Signal Company under designs made by John Leisenring, signal engineer of the traction system. The automatic stop device is an air valve which is tripped by a lever arm attached to the signal blade. The automatic valve is placed on the upper deck of the car roof and connected to a trip lever arm through a square shaft. When a car is run under a home signal in the stop position the lever arm is tripped by a light flexible arm supported about 12 in. below the signal blade. This trip arm is raised by the blade when the signal assumes the clear position.

The lever arm attached to the valve is so arranged that it will be tripped only by trains running in their normal direction. In other words, a car may back under the signal without the automatic stop acting, but when a car passes a signal in the stop position, if the car is running in its normal direction, the trip operates the valve lever arm, raising it about 2 in. This in turn revolves the square shaft which raises the top cap of the air valve and allows the air-brake train line to exhaust directly to atmosphere, thus giving the brakes an emergency application. The valve is so balanced that it remains open until the air pressure is reduced to the desired amount, and then the valve closes automatically, releasing the brakes. By means of an adjustment the degree of air-brake application can be regulated so that the train may be brought to a full stop or just brought down to slow speed and then the brakes released.

The table on page 871 shows the results of six tests made with the general manager's office car on which this

automatic stop device has been installed. This record shows the speed of the car when tripped, reservoir pressure, brake-pipe pressure and brake-cylinder pressure, which seemed to build up slowly after the car had been tripped. The figures given are the maximum pressure reached before release, the distance required to stop and the time required to release the brakes. In connection with test No. 6 the power was not shut off, nevertheless the car was stopped in 700 ft.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Speed, m.p.h.	32	38	40	40	46	35
Reservoir pressure	105	95	108	116	110	110
Brake pipe pressure	68	68	68	68	68	68
Brake cylinder pressure	54	60	50	35	35	35
Distance required to stop	400 ft.	500 ft.	600 ft.	720 ft.	800 ft.	700 ft.
Time required to release brakes	20 sec.	15 sec.	10 sec.	Lever put to lap position.	*20 sec.	14 sec.

*Full stop before brakes released.

This automatic stop device is still in the experimental stage, and it is not intended at this time to equip all of the rolling stock with the new device.

The party then proceeded to Mackinaw Junction and thence to Springfield.

After the session of the association at Springfield, the party resumed its trip and luncheon was served on the car between Springfield and Decatur. The party did not enter Decatur, but passed around the city on the new freight belt line which is used for handling the heavy through traffic. From the north end of the belt line the party was taken over the Decatur-Bloomington line. This run of 47 miles was made in 1 hour 20 minutes. On arrival at Bloomington the Chicago members of the party were the guests of the Illinois Traction System, enjoying an automobile ride until they took their train for Chicago. The other members of the party proceeded on the Illinois Traction System to Peoria.

REPORT OF THE BLOCK SIGNAL COMMITTEE ILLINOIS ELECTRIC RAILWAYS ASSOCIATION

At no time has this committee felt that its work had progressed sufficiently far to make definite recommendations, but it has thought best to present, as a basis of discussion, a review of signal practice.

AMERICAN ASSOCIATION COMMITTEE REPORT

The interest with which the subject of signaling is being considered by the electric railways of the country at large is illustrated by the remarkable report submitted last October at the Atlantic City convention of the American Electric Railway Association. That committee after one year's work presented a report of 138 pages which is well worth careful reading. All but two of the roads which are reported as using signals stated that signals not only afforded the desired protection but also aided the movement of trains.

There are now ten states whose commissions have already received authority to require adequate signaling. Our immediate neighbors in Indiana have felt the result of such a ruling and are installing at this time 33 miles of continuous track circuit signals and 18 miles of remote-control dispatchers' signals.

STANDARDIZATION OF ASPECTS

A most important subject also under consideration is that of aspects and materials. Electric roads would be foolish not to take advantage of the past experience of the steam roads in standardization. Signals have been common on steam roads for thirty years and yet they are adopting standards only now. The result was that almost every road had a different way of telling its trainmen the same thing, and the cost of the apparatus was greatly increased.

The electric roads have even a greater reason for uniformity than had the steam roads, as unfortunately our trainmen are less stable than those of steam roads. It is highly gratifying to see that the majority of manufacturers work so well with the committee along these lines. Even those with trolley contact signals alone are working toward a standard semaphore or light instead of the many nondescript indications used in the past.

With regard to the standardization of signal aspects, the present tendency of interurban roads is to make operating agreements so that the cars of one company can use the tracks of another company, and there are cases where three and even four roads are operating over the same track; and very often each of these companies will have a different signal aspect on its own road, so that motormen and trainmen are required to understand almost every indication in existence in order to get over the road. Conditions of this kind mean not only slower running but unnecessary extra strain on the trainmen.

In some cases where interurban roads cross the tracks of several different steam roads a white light is used at one crossing for a clear indication and at the next crossing a green light means the same thing. This is entirely unnecessary, as the indication to be used by the electric line will not conflict with any system that is in use by the steam road. Consequently electric roads when crossing a steam road should insist on using their own indication instead of using that used by the steam road. It might also be well to give more study to the indications that are placed at crossings, sidings and passing tracks.

SIGNAL SITUATION IN INDIANA

Extensive investigations have been made by the representatives of the Railroad Commission in Indiana in conjunction with the interurban roads, and as a result contracts have been made with the General Railway Signal Company for the installation of continuous track-circuit light signals as follows: Terre Haute, Indianapolis & Eastern Traction Company, 15 miles; Indiana Union Traction Company, 18 miles; also, two pieces of gauntlet track on the Chicago, Lake Shore & South Bend Railway have been protected by continuous a.c. track circuits controlling lamp signals of Union Switch & Signal Company manufacture.

The Indianapolis & Cincinnati Traction Company is installing 18 miles of the Simmen automatic signal and dispatching system. With this system the indications are given directly in the motorman's compartment and are controlled by the dispatcher through electrical switches interlocked mechanically. The dispatcher's equipment also gives him a continuous permanent record of the position of all trains and the time at which they pass each siding.

It is understood that the Railroad Commission will await the results of demonstrations and operations of these different signal systems before giving further orders for additional installations.

The active steps leading up to these trial installations were begun in December, 1910, when Governor Marshall of Indiana called a meeting of interurban railway officials to discuss operating rules and safety. The Governor stated that he was calling the meeting in order that he might have definite information regarding the existing laws and the interurban business situation, and because of the fact that unless full information regarding existing conditions was given the accidents which had occurred shortly before that time might lead to the passage of drastic statutes.

A committee of representative managers was appointed to study the subject of block signals and report to the commission. This committee consisted of Arthur W. Brady, Indiana Union Traction Company; C. N. Wilcoxon, Chicago, Lake Shore & South Bend Railway; Robert I. Todd, Terre Haute, Indianapolis & Eastern Traction Company; C. D. Emmons, Chicago, South Bend & Northern Indiana Railway.

At a meeting late in June, 1911, this committee was authorized to secure proposals on continuous track-circuit

block signals using lights instead of semaphores to be installed on sections of four railroads in Indiana. A study of the local conditions on the roads followed with the result that a trial order was placed for the 51 miles of protection mentioned.

SIGNAL PRACTICE AND RESULTS IN ILLINOIS

Your committee has corresponded with a number of roads in Illinois regarding signals. From an analysis of the replies received from the member companies it appears that three roads are using signals to facilitate traffic and prevent delay when two opposing cars get at the same time into what amounts to a single-track gauntlet between sidings. These are at points where there is comparatively low-speed operation, and in all cases trolley or manually operated signals are used.

Seven roads are using signals for some form of protection, and three of these employ them for single-track blocking, three for protection at curves and four for protection of gantlet or crossover movements. None of the roads outside of the Chicago Elevated Railways reports the use of any spacing signals on double track.

Concerning the types of signals used, four roads are using the a.c. track-circuit type, five are using trolley-contact type and two are using manual blocking with light indications. Of the four roads using a.c. track-circuit signals only one employs large lenses and light for the daylight as well as night indication.

Of the interurban trackage (exclusive of city) there are four cases where a.c. track circuits are used, three cases where trolley-contact signals are used and two cases where manually operated blocks with light indications are used.

As to the service which the signals have rendered, it appears that the following conclusions are justified from replies received:

Alternating-current track-circuit signals have a high cost of installation, even where the lens and light are used instead of standard semaphores. This type of signal is considered very reliable and safe, and evidently where it has been used these higher costs have appeared to be entirely justified, considering the service.

The trolley contact-operated signals are much cheaper to install. The replies indicate that this type of signal is satisfactory for facilitating traffic and saving delays where low-speed operation prevails.

The manually operated block is the cheapest to install and maintain, being made up usually by the operating company. It has certain well-known disadvantages, such as that of requiring the conductor to leave his car and delaying operation. Probably there always will be some situations where this type of signal is entirely satisfactory for the conditions of service.

BLOCK SIGNALS ON THE CHICAGO ELEVATED RAILWAYS

On the main line of the South Side Elevated road, between Twelfth and Forty-third Streets, a distance of 4 miles, an electro-pneumatic block system has been installed. This consists of a d.c. track circuit on one of the running rails, which has been insulated and is used exclusively for this current. The signals are semaphore arms and are normally clear. This system was installed by the Union Switch & Signal Company and has given very satisfactory service. Two relays are used in each block, one at each end. This was found necessary on account of the foreign current creeping into the insulated rail.

On the Northwestern Elevated road several of the curves are protected by block signals. One of the running rails is used for a d.c. track circuit. These signals are electro-pneumatic semaphore type with track trips so designed that should a train pass the semaphore set at "danger" the track trip would immediately set the air on the train in emergency. This system was installed by the Union Switch & Signal Company and has given entire satisfaction.

On one of the branches of the Metropolitan West Side Elevated Railway a part of the line is a single-track railroad. This piece of single track, in addition to having a towerman at either end, is also protected by a facing protection consisting of red lights hooded so as to be seen easily in daylight as well as at night.

The elevated railroads are also using a normal danger block signal system, which is standard on the 38 miles of double track on the Metropolitan West Side Elevated Railway and is being installed gradually on all of the other elevated lines. This system consists of 12-in. square white boards with 8-in. black disk centers. An incandescent light is placed just below the disks for night indications. The 12-in. square is set with its diagonal on the center line of the upright post and is placed on the opposite side of the track from the motorman. On some points on the Metropolitan Elevated road the train interval is less than thirty seconds; but the signal system causes no delay whatever to trains. These blocks are so placed that the motorman must be able to see signal No. 2 before he is permitted to pass signal No. 1. Should there be a train between signals Nos. 1 and 2 it would cut off the view of signal No. 2, and consequently the train would have to come to a full stop at signal No. 1. In other words, the train ahead is made a part of the signal.

Piedmont Traction Company Light and Relay Case

This system will also start trains automatically one at a time after a tie-up. This feature is a great help to the power house after a blockade on the line. This system has been in use for about three years and has given entire satisfaction. It was first described in the Electric Railway Journal for Dec. 19, 1908, page 1614.

SIGNALS ON THE AURORA, ELGIN & CHICAGO RAILROAD

On the third-rail division, exclusive of semaphore signals which are operated from signal towers and control grade crossings with intersecting lines, the only type of block signal used is the a.c. track circuit with standard semaphore and light indication.

Four blocks of these are installed, two for the protection of curves on single track, one for protection in a 9000-ft. gantlet on a single track between the end of the main line and a branch line from the single track, and the fourth for protection of crossover movements on the double-track main line at a point where a branch line leads off.

The first three blocks were installed by the General Electric Company and the last one by the General Railway Signal Company.

On the Fox River division, which is operated by trolley, there are twelve blocks of the United States trolley contact-operated signals which were installed in all cases in city streets to facilitate traffic. They are satisfactory for the purpose for which they were installed.

LIGHT SIGNALS AND THEIR USE

Appendix E of the report of the joint committee on block signals of the American Electric Railway Association de-

scribed the general basis on which consideration is being given to the use of light indications for day as well as night service. Since the report of the American Association committee was published last fall several interurban roads in the north Central States and nearby States have placed orders for automatic block signal equipment with light indications only. Notable among these roads are the Terre Haute, Indianapolis & Eastern Traction Company, the Indiana Union Traction Company, the Piedmont Traction Company, the Fort Dodge, Des Moines & Southern Railroad and the Chicago, Lake Shore & South Bend Railway. These will have signal equipment with the standard a.c. track circuits, relays, feeding system, etc., and will have light indications for both day and night use. The indications will be given by metallic-filament lamps placed behind large red and green lenses. The fact that five important roads have decided to use light signals should give considerable weight to their cause.

The chief reason for the use of light signals is that of economy in first cost and also continued economy in maintenance and operation. These economies result from the simplicity of the signal itself. With only the light indications the installation avoids the use of a motor mechanism, electric holding devices and the large mechanism case. Substantial and artistic masts and relay cases for bases with top castings for inclosing the large lenses have been designed by the signal manufacturers, particularly for interurban conditions. In some instances the roads have considered mounting the light signal cases on the regular trolley poles or on separate poles at about the height of the motorman's face.

The American Association committee report states: "Particular attention is called to the fact that with light signals a system having the continuous track circuit can be secured at a minimum cost. Another consideration is the reduced maintenance cost for light signals as compared with semaphores, as even with the modern perfection of semaphore signal mechanisms the attention required for the latter is necessarily greater." That committee report also suggests a compromise agreement which would have semaphore indications for the home signals and light indications for the distance signals.

The cases for light signals are built for any number of lenses either in one or two directions, that is to say, on a single-track road where the signals for opposite directions were at a coincident location the same mast with lenses pointing in both directions might be used.

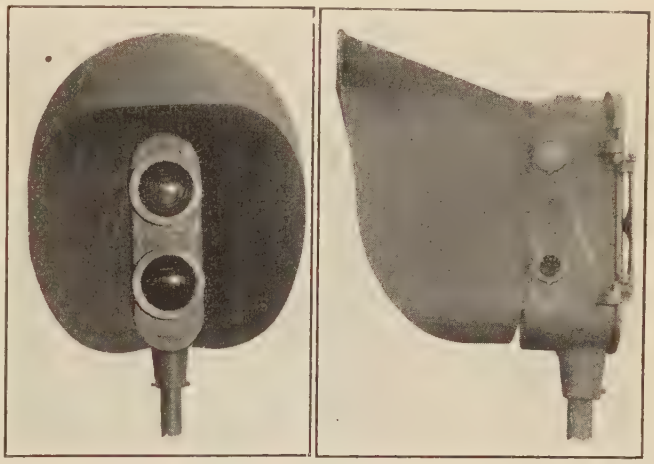
Regarding the arrestiveness of the signal, experiments have shown that it can be seen plainly 1500 ft. on a bright day from a car moving about 40 m.p.h. One point to be remembered in connection with the arrestivness of semaphores or large light signals is that on a day when it is difficult to pick out objects at a distance the light signal has a great advantage in arrestivness over the semaphore.

The light signal is not wholly without disadvantages. Chief among these may be pointed out the fact that it will be difficult for the passengers to see whether a signal has operated behind their train, and unless back lights are put in the cases the crew will not be able to see whether their car has set a signal. This would work against the strong publicity feature which the Illinois Traction System has obtained by including in its general advertising the slogan "Watch them work." Another possible disadvantage is phantom indications. Your committee is advised by certain signal engineers that unless the lenses and the hooding are designed very carefully there will be a danger that phantom signals will be given by reflections from the headlights. This is a subject that should be investigated carefully.

In February, 1911, investigations of the applicability of light signals to interurban use were made on the high-speed line in Michigan. Lenses of approximately 10½ in. and 8½-in. diameter were tried, one red and one green lens of each size. It was found that an 8½-in. lens with an 80-watt, 117-volt tantalum lamp and a rather flat, hyperbolic reflector gave better results than the same lighting equipment with the larger lenses.

The investigations of the arrestiveness of the light signals were made in February on an especially clear day with the bright noonday sun shining on dazzling fresh snow. The signals were set up near a substation where the lamps could be fed directly from a large feeder in which no appreciable drop was observed when cars accelerated quickly. The position of the signal was about 3500 ft. north of a curve through a cut. This curve and the tangent track was down grade toward the signal. Thus it was possible to start the car around the curve and run out of the cut with the observers on the front platform of the car not knowing in what position the signals were set. Flags were placed along the track to indicate the distances from the signal. With different settings of the signals, unknown to the observers on the car, several observers noted the distances at which they could read the signals as well as the distance at which the signals were arrestive. An average of these distances when the car was running at about 45 m.p.h. showed that with the 8½-in. red lens the signal was arrestive at 1500 ft. The green lens of the same size was arrestive at about 1000 ft.

It should be noted that the signal was facing the sun



Front and Side Views of Hooded Light Signal for Night and Day Use

and the observers had their backs to the sun, thus all the objects behind the signal were well illuminated and these objects consisted of the usual miscellaneous buildings to be found in a small country town. When the signal was faced to the north and the car run southward toward the signal it was noted that the red signal was arrestive up to 3000 ft., the maximum distance available. Thus it was seen that the light signal was considerably more arrestive when the observer was looking at it and at the sun at the same time.

In connection with these investigations it should be remembered that these were the first signals of the kind tried and considerable development has been made since.

CONCLUSION

In conclusion your committee urges that the individual roads continue to give consideration to the conditions surrounding the application of signals to electric railways, and that those roads which now have signals keep records of the correctness of performance and also of the cost of maintenance.

The Bolivia Development & Colonization Company has been incorporated in Maine with an authorized issue of $25,000,000 of stock to build and operate electric generating and distributing plants and electric railways.

Executive Committee on the Eastward Journey

Accounts of the Interesting Proceedings of the Party of the American Electric Railway Association at Spokane, Fargo, Minneapolis, Omaha and St. Louis

The party of members of the executive committee and officials of the American Electric Railway Association which is making a trip through the country in the interest of the association arrived at Spokane, Wash., on May 18. The members of the party were met there by officials of the Spokane & Inland Empire Railroad and the Washington Water Power Company and were taken about the city in automobiles. The following officials of the Washington Water Power Company met the travelers: Henry M. Richards, chairman of the executive committee and first vice-president; D. L. Huntington, president; R. A. Willson, general superintendent of railways and park manager, and J. B. Fisken, superintendent of light and power. Waldo G. Paine, second vice-president of the Spokane & Inland Empire Railroad, was also in the party that greeted the visitors. The entire party inspected the local systems and also the plants of the Washington Water Power Company and then had luncheon at Davenport's Restaurant.

At the conclusion of the lunch President Thomas N. McCarter, of the association; Oscar T. Crosby, president of the Wilmington & Philadelphia Traction Company, and Charles C. Peirce, General Electric Company, made addresses on the mission of the trip. Their remarks were received with approval by those who attended the luncheon. In addition to the railway officials, many leading citizens and public officials were present, including Judge Rudkin of the United States Court and Judge Hunecke of the Superior Court.

During the afternoon a trip was made over the interurban line of the Washington Water Power Company to Medical Lake. This was found to be one of the best interurban lines seen on the trip. The rear car of each train on the road is fitted with an observation platform.

The trip afforded an opportunity for a demonstration of the operation of Messrs. Wright and Willson's device for automatic release of the air brakes when the train accidentally passes a block signal.

The party was entertained at dinner in the evening at the Spokane Club by Mr. Huntington.

RECEPTION AT FARGO

The party arrived at Fargo, N. D., on the afternoon of May 20. The visitors were met at the train by a number of public officials and officials of the Fargo & Moorehead Street Railway and the Union Light, Heat & Power Company, both of which are controlled by H. M. Byllesby & Company. Among those who greeted the visitors were M. L. Hibbard, general manager of the railway and lighting companies; C. B. Brown, general superintendent of the railway company; W. H. Chestnut, assistant secretary of the Fargo & Moorehead Street Railway; W. H. Brown, of Grand Forks; Mayor Sweet, C. P. Stine, secretary of the Commercial Club, and Thomas Baker, Jr., representing the reception committee of the Commercial Club.

During the remainder of the afternoon the visitors were taken for a ride around the city in automobiles. In the evening they were entertained at dinner at the Commercial Club, a representative business organization of the city with a membership of between 500 and 600 people. Over 100 persons attended the dinner. Those who were present included, in addition to the people who received the visitors on their arrival in the city, W. S. Stambaugh, a leading attorney, who was toastmaster; Judge Amidon of the United States Court; Mayor Davy, of Moorehead; City Attorney Smith, of Fargo; ex-Mayor Lovell of Fargo; ex-Lieutenant Governor Lewis of Fargo; State Senator Kennedy, Representatives Stern and Price, County Auditor Leech, President Weld of the State Normal School, aldermen of both Fargo and Moorehead and a number of prominent bankers.

Reception Committee and Visitors at Portland, Ore.

After dinner several talks were made. Mayor Sweet of Fargo and George E. Perley, a leading attorney of Moorehead, were the local speakers. Thomas N. McCarter, Oscar T. Crosby and Charles C. Peirce made speeches which were received with enthusiasm. Mr. Crosby in his talk denounced the sensational articles of the so-called uplift magazines, and this sentiment was received with applause.

ARRIVAL IN MINNEAPOLIS

Owing to the absence from Minneapolis of C. G. Goodrich, president of the Twin City Rapid Transit Company, no public meeting was held when the party arrived in that city on May 21. The visitors were taken in a special car to Lake Minnetonka and were then taken for a trip about the lake in one of the boats belonging to the Twin City Lines. Afterward lunch was served at the Country Club. During the automobile ride about Minneapolis and St. Paul in the afternoon, the party visited the new carhouse

and shops of the company. The provisions made for comfort and recreation of employees in this new improvement were the best that have been seen by the party so far during the trip. The visitors were entertained at dinner at the Minneapolis Club in the evening.

Those who met the party, representing the Twin City Rapid Transit Company, were W. J. Hield, vice-president; A. M. Robertson, second vice-president; Horace Lowry, general manager, and A. W. Warnock, general passenger agent. A. G. Whitney, president of the Granite City Railway, of St. Cloud, Minn., also met the party during its stay in Minneapolis.

MEETING IN OMAHA

The representatives of the American Electric Railway Association were at Omaha on Wednesday, May 22. A meeting held at the Omaha Club was attended by Mayor Dahlman and all the members of the new commission representing the city government. The following representatives of the Omaha & Council Bluffs Street Railway were present: G. W. Wattles, president; Frank T. Hamilton, vice-president; W. A. Smith, second vice-president and general manager; L. C. Nash, secretary and treasurer; General Webster, counsel. A. H. Rogers, president of the Southwest Missouri Railroad, Webb City, Mo., also met the party at Omaha.

The meeting at the Omaha Club was short in order that the visitors might leave at the time scheduled for their train, but a number of points of particular bearing upon the mission of the visitors were brought out. General Webster presided. Mayor Dahlman made a speech in which he assured the members of the executive committee that public utilities do and will receive fair play in Omaha.

Thomas N. McCarter, president of the American Electric Railway Association, made a speech in which he presented a point of view that appealed to the local hearers. Some veterans of the street railway industry were present, notably W. A. Smith, second vice-president Omaha & Council Bluffs Street Railway, who began business in Omaha with a horse or mule railway in 1863, and C. R. Tyler, who has been associated with him ever since then as a stockholder and who testified to the changes which had occurred in the business and to the fact that Mr. Smith as a condition of the investment had compelled him to go through the first eighteen years without receiving any dividend.

The Street Car Fare

The average fare per passenger carried by the P. R., L. & P. Co. City Lines, during 1911, was 3.65 cents, distributed thus:

BOND INTEREST
POWER COST
DAMAGES, INSURANCE AND GENERAL EXPENSE
MAINTENANCE AND DEPRECIATION
TRANSPORTATION EXPENSES
TAXES
SURPLUS
THIS SECTION REPRESENTS THE REDUCTION DUE TO COMMUTATION FARES, TRANSFERS AND FREE TICKETS FOR WHICH THE COMPANY RECEIVES NO COMPENSATION.

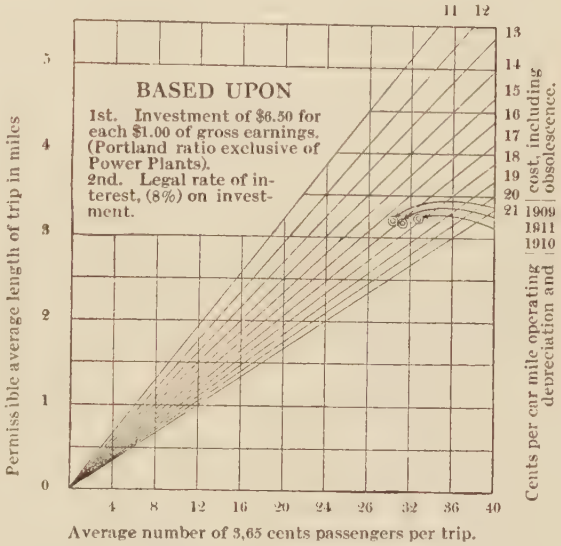
Division of Nickel Fare		Percentage of Average Fare (3.65c)
.725c	Maintenance and Depreciation	19.85%
1.050	Transportation Expense	28.80%
.360	Power Cost	9.73%
.305	Damages, Insurance, and General Expense	8.31%
.910	Bond Interest	25.00%
.240	Taxes	6.64%
.060	Surplus	1.67%
1.350	Reduction due to Commutation Fares, Transfers, and Free Tickets	
5.000c	Total	100.00%

From the Surplus must come a portion for extensions and improvements, since by the operation of the P. R., L. & P. Co. bond mortgage 20% of all capital expenditures must come from the earnings, also any discount which may have to be paid when the bonds are sold. If any surplus is left after that, it may be applied to dividends for the Stockholders.

Length of the Street Car Ride

An analysis of the operating statistics of the P. R., L. & P. Co. city lines for the past three years, allowing 20% of gross street car earnings for maintenance, depreciation and obsolescence, shows the following:

	1909	1910	1911
Cost of all Operation and Allowance for Depreciation and Obsolescence cents per Car Mile	16.98	17.71	17.21
Average Number of Passengers per One Way Trip	30.90	32.70	31.20
Apply these to the above chart:			
The Permissible Average Length of Trip per Passenger	3.19	3.23	3.18


BASED UPON
1st. Investment of $6.50 for each $1.00 of gross earnings. (Portland ratio exclusive of Power Plants).
2nd. Legal rate of interest, (8%) on investment.
Permissible average length of trip in miles
Cents per car mile operating cost, including depreciation and obsolescence.
1909
1911
1910
Average number of 3.65 cents passengers per trip.

This chart clearly shows the limitations of permissible average length of trip per passenger in Portland. Thus every passenger carried a greater distance than 3.18 miles in 1911 caused a loss, which had to be offset by the shorter haul passengers.

Every extension and improvement expenditure decreases the permissible average distance, by increasing the ratio of investment to earnings until the earnings shall have increased sufficiently to restore or diminish the ratio of 6.50 to 1. Likewise every increase in service such as more frequent cars, or service permitting less passengers per car or operation of new extensions decrease the average distance, since this increases the cost of operation per Car Mile.

Analysis of Street Railway Operations in Portland, Ore., Compiled for Dinner of the Executive Committee

Frank T. Hamilton, vice-president Omaha & Council Bluffs Street Railway, who had just returned from the East, said that had he realized previously the nature and purpose of the addresses to be delivered by the visitors, the soundness of their doctrines and the strength with which they were to be presented, he would have had thousands of people of Omaha present to listen. This is wholesome doctrine, Mr. Hamilton added, to spread over the land. Public utility companies of all kinds everywhere should join this movement, giving publicity to the fundamental facts of their existence and showing why the corporations should participate strongly and intelligently in a frankly conservative movement.

The experience indicated by Mr. Hamilton's talk is one that has taken place at a number of the meetings in which the party has participated during the journey. The interest aroused by the visits of the representatives of the association to the various cities has been so great that the number of 3000 persons addressed already at the meetings could be multiplied easily many times on another journey. The committee feels that these facts should be realized by member companies, individual members and the general public.

PROCEEDINGS AT ST. LOUIS

Continuing on the eastward journey, the members of the party arrived at St. Louis, Mo., on the morning of Thursday, May 23. A committee composed of leading railway and manufacturing people met the party at the train. In the committee were the following officials of the United Railways of St. Louis: Capt. Robert McCulloch, president; Richard McCulloch, vice-president; Bruce Cameron, superintendent transportation, and James Adkins, secretary and treasurer. L. C. Haynes, vice-president East St. Louis & Suburban Railway, and C. F. Hewitt, general superintendent of that company, were also present. Others in the committee were Arthur S. Partridge, Scott H. Blewett, American Car & Foundry Company; William Clegg, Westinghouse Electric & Manufacturing Company, and G. D. Rosenthal, General Electric Company.

At noontime a rousing meeting was held in the City Club, at which 400 were present. The meeting was addressed by Oscar T. Crosby, who discussed the subject which he has treated a number of times during the journey, "A Fair Return to Capital."

In the evening a large dinner was given to the visitors by Captain McCulloch. It was held at the St. Louis Club, and 100 people were present, including the Mayor and Public Service Commission of the city, as well as nearly all the other prominent members of the city government. Thomas N. McCarter spoke earnestly with the idea of awakening the business men of the city to a realization of what public utility companies really are and the onerous conditions which accompany their operations and the investments made in such properties. Mr. McCarter was followed by Oscar T. Crosby, who discussed the general nature of the mission which led the party to make its long trip. Charles C. Peirce, after speaking for a few minutes in a humorous way, took up the serious side of the journey and showed how effectively the American Electric Railway Manufacturers' Association works hand in hand with the parent American Electric Railway Association.

Prominent citizens of St. Louis did not hesitate to declare that the motive responsible for the trip of the visiting committee is remarkable in the history of American industries and that the railway men are rendering a great service to the public. The St. Louis meeting was among the most conspicuously successful meetings of the entire trip.

The party left for Louisville late in the evening.

J. C. Hutchins, president of the Detroit (Mich.) United Railway, returned on May 10, 1912, from a trip abroad which covered three months.

NEW ENGLAND STREET RAILWAY CLUB MEETING

The regular monthly meeting of the New England Street Railway Club was held at Young's Hotel, Boston, on the evening of May 22. President Lees presided. The speaker of the evening was Gregory C. Davison, mechanical engineer of the New London Ship & Engine Company, New London, Conn., his subject being the American-Nurnberg oil engine.

Mr. Davison discussed at length the principles of operation of the Diesel type of oil engine, comparing theoretical and practical cycles of cylinder performance and showing a large number of lantern slides of engines in service. The Diesel engine has now been built in sizes of from 8 to 2000 hp, and it has the well-known advantages of simplicity of construction and high operating efficiency, producing 1 hp-hr. on about 0.4 lb. fuel oil of 18,000 b.t.u. heat value. The engine will burn any form of liquid fuel, has no carburetors, mixtures of air and gas, ignition system, explosions or jars when in operation.

Mr. Davison said that the best steam plants require from 1.5 lb. to 3 lb. fuel per hp-hr., and on the Pacific Coast the best which can be done in large turbine stations burning fuel oil under the boilers is about 1 lb. of fuel oil per hp-hr. In the municipal lighting plant of Halle, Germany, reciprocating steam engines are being displaced by 2000-hp Diesel engines weighing about 400 lb. per hp. In marine service the engine has been made reversible by the use of the two-cycle plan of operation. There appears to be a field for the engine in electric railway service in the sparsely settled districts where long headways prevail, the engine being installed on the car, driving the generator, which in turn operates motors suspended from the trucks. This development has only begun in connection with the Diesel engine.

Following the address Mr. Davison answered a number of questions regarding the Diesel engine. He stated that the weight for a given power is greater than that of an ordinary gasoline engine. A slight change in the spray valve enables alcohol to be burned with ease. Crude oil with an asphaltum base can be burned as efficiently as oil with a paraffine base. The efficiency of the engine at fractional loads is excellent, even in small sizes. A plant can be started in from five to ten seconds. Governing is effected by varying the amount of fuel introduced into the cylinder. All economy figures are given on the brake hp basis. The overload capacity of the engine is about 10 per cent. A 100-kw generator should be direct-connected to about a 150 brake hp engine. With a fuel consumption of 0.4 lb. per hp-hr. at full load, the consumption at three-quarters load runs about 0.5 lb.; at half load, 0.6 lb., and at one-quarter load, 0.75 lb. Mr. Davison said that where the engines were properly operated the maintenance and repairs should be less than in a steam plant of equal capacity.

The department of electrical engineering of the Massachusetts Institute of Technology has under way an important investigation on the adaptability of electric vehicles for trucking purposes, more especially with reference to the conditions in Boston and its vicinity. The inquiry is directed along several particular lines, including cost of the service, convenience of the service, difficulties and expenses due to the delays in loading and unloading at freight houses and the like, delays caused by drivers, and corresponding matters. An appropriation for this work was made by the Edison Electric Illuminating Company, Boston. The department has had erected in Brookline a 700-ft. span of No. 00 bare stranded wire to represent a transmission span on towers and has had this span under observation during the severe weather of this winter. The object is to learn more exactly the effects of ice, sleet and wind loads and of temperature effects on the stresses imposed upon the wire and its supports. This research is being carried on under the direction of Prof. Harold Pender.

Papers Read at Pacific Claim Agents' Meeting

Abstracts of Addresses Made at the Los Angeles Meeting This Week—The Subjects Discussed Include the Education of Trainmen in Order That They May Be Efficient and the Use of Safety Devices

The annual meeting of the Pacific Claim Agents' Association was held in Los Angeles, Cal., on May 21, 22 and 23. Papers were presented by a number of members of the association. Abstracts of these papers follow.

E. H. ODELL ON MEDICAL EXPERT TESTIMONY IN PERSONAL INJURY CASES

E. H. Odell, claim agent of the Tacoma (Wash.) Railway & Power Company, discussed the subject of "Medical Expert Testimony in Personal Injury Cases." He said that the opinion of a physician, based on a careful examination of a claimant's injury, was of the utmost importance to the claim agent in the determination of the value of a claim. Without this diagnosis, there would be no way in which an adjuster could justly assess the measure of damages, especially if the case should be at all intricate or complicated.

Mr. Odell said a conservative estimate placed at $2,500,000 the amount paid out annually in judgments in the courts of the United States that were based wholly on medical expert testimony. The public service corporations paid a proportionate part of this amount. If the judgments were just, no one would have reason to complain, but they were not. In most cases they were unreasonable in amount; some were exorbitant in the extreme, and in all cases the lawyers and physicians who worked for a contingent fee secured a large part of the proceeds, while the unfortunate victims who litigated were compelled to take that which was left after a distribution was made. So far no one had done anything to reform these practices other than to complain or find fault. The physicians blamed the situation upon the lawyers, while the lawyers put it upon the physicians, and both of these parties united in blaming the court and the jury. Nobody would deny that evils do exist in these matters.

Mr. Odell said that a comparatively small amount of simplification in court precedure would do much to remedy the situation. The bar association had it within its power, working in conjunction with the judges, to give the courts a new and better course of procedure. How could claim agents aid in the proposed movement for reform of court procedure? The members of the Pacific Claim Agents' Association were credited with some profitable innovations in reform along other lines, among them that of education of the public in the prevention of accidents. The association might also undertake the education of judges, lawyers and physicians. In April of the present year leading attorneys representing thirty states or 20,000 practising lawyers met in Chicago to effect a standard codification of the laws, simplification of court procedure, limitation of appeals, equalization of cost of litigation, etc. While they were in session they received a letter from Mr. Odell requesting changes in the rules of procedure. Mr. Odell said that before the adjournment of the convention he would offer a motion providing for the appointment of a committee to act in conjunction with a similar committee appointed by the claim agents' association of the steam roads to draft resolutions urging court reform. These resolutions should be sent to the national and state commissions having this work in charge. For the first time in one hundred years there appeared to be a desire on the part of leading lawyers of the country to effect wide changes in court procedure, and it was therefore an opportune time for the claim agents to take action.

PAPER OF IDA P. NEWEL ON THE GOLDEN RULE

Ida P. Newel, chief clerk Portland (Ore.) Railway, Light & Power Company, read a paper on the subject "The Golden Rule as Applied to Claim Work." She said that any business transaction would terminate with greater satisfaction to a fair-minded person if this rule should be followed by all parties concerned. If a claim agent refused to pay a claimant for an injury or damage sustained by the carelessness of the claimant, would he not be doing as he would be done by? On the other hand, if the facts in the case showed that the railway company or its employees were negligent in causing an accident and that, according to the law, the company was liable for the injury or damage, the claim agent, if he were a believer in the golden rule, would not expect the railway company to pay in excess of the actual amount of the damage. He would be practising the golden rule if he refused to give the claimant an exorbitant sum in a like case. A claim agent had a part of the bank account of the railway company in his possession. If he is to practise the golden rule he must handle this money more sacredly than if it was his own.

THOMAS G. ASTON ON METHODS TO BE PURSUED IN OBTAINING EVIDENCE

Thomas G. Aston, claim agent Washington Water Power Company, Spokane, Wash., discussed the subject "Methods to Be Pursued in Order to Obtain the Best Evidence Possible, with Reference to Its Use in the Settlement of Claims and in Court." He said in part:

"There are some accidents where it is obvious that a prima facie case of negligence obtains, such as derailments or collisions between your own cars, so that no investigation is necessary. It is assumed that the trainmen have followed instructions in securing the names and addresses of the injured party and all witnesses upon the car. Impress upon the trainmen that they must give all attention necessary to the comfort of the injured party and that they must give this attention before leaving him.

"They should be instructed, upon the occurrence of an accident, to notify the claim department or some member of the transportation department immediately so that the claim department may receive notice of the accident as soon as possible. At the same time they should call the company physician. When the accident is reported the trainmen sending in the report should inform the claim department what has been done for the injured party, whether he has been taken to his home or to a hospital or is still at the scene of the accident.

"It is well to instruct the trainmen, if an accident should happen in connection with the step, to make an examination immediately, and if the step is in good condition to call the attention of some of the passengers to its condition. They should also make an investigation of the condition of the street where the injured party alighted.

"Question closely regarding the place where the accident happened, whether upon a crossing, within the intersection or within the block between the streets. Find out how close to the regular stopping place the accident happened. By doing this you will be able to determine whether or not the injured party alighted from the car while it was in motion. If the party claims that he was injured by the sudden starting of the car or by a sudden lurch of the car, you should investigate at once as to whether or not the other passengers on the car felt any unusual lurch or jerk. If you find the accident happened within the intersection, it is well to find where the party's residence is, whether near the side of the street the car had passed or near the side of the street the car was approaching. It might be that the reason why the party left the car while it was in motion was because he was in a hurry to reach his home and did not take time to wait until the car reached its regular

stopping place. If you find the claimant alleges that he was thrown from the car in the middle of the block, it is essential that you find out what the condition of the track is about that point so as to satisfy yourself whether an unusual lurch of the car could have been caused by the condition of the track.

"Statements should be taken from all witnesses as soon as possible after the accident. It is advisable in gathering evidence to have the idea in mind that there is a chance for you to be at fault, rather than to investigate with the idea that the company is not to blame. If you investigate with the idea in mind that you might possibly be to blame you will get all the facts and make a more complete investigation, for the reason that you do not know whether or not you will be able to make a settlement, if such is desired, and you feel that there may be a chance for you to defend the case in court. If, on the other hand, you start in with the idea that the company is not at fault, you may be slack in your investigation, overlooking such points as might be material in the case. Do not overlook taking a statement from every passenger or witness that it is possible to find. Do not be satisfied with the statements of one or two witnesses. Street witnesses are often the most valuable, especially in cases of collision or in boarding and leaving a moving car. There are times when a new witness might suggest something to you that you have overlooked or that has not been brought out by any of the other witnesses.

"It is our custom in personal injury suits to have the plaintiff examined by three physicians, if possible appointed by the court, just before the case comes to trial. If the court will not appoint them, you should then have three physicians other than the company physician examine the plaintiff.

"In all cases treat the injured party or claimant in such a manner that you will make him feel that he is dealing with friends instead of enemies and that he is going to get the benefit of all doubts in the case and that if the company is at fault he will receive fair compensation."

O. C. MATHIS ON EDUCATION

O. C. Mathis, Tacoma (Wash.) Railway & Power Company, discussed the topic of "Education in the Prevention of Accidents." He said in part:

"The professional glass blower gets the habit of handling his wares so carefully that he handles a crowbar the same way. He does this because he knows the glass will break. The point is, teach your trainmen the nature of the human traffic they are handling and they will use care to the extent of their ability to appreciate your teachings. Impress upon them the fact that the human traffic they are handling is more fragile than the most delicate glass ever blown.

"There are two ways of conveying knowledge—by precept and by example. The latter method of teaching trainmen has been in vogue since there were trainmen to teach, and, besides the burden of cost it has entailed, we can see no reason to believe that it will ever be a success. Let's change the method. Now, the ideal way would be to have the positions of motorman and conductor harder to procure. Let these positions represent work done, real merit and something to strive for.

"In addition to teaching the havoc an uncontrolled street car will play, the frailty of the human body and first aid to the injured, subjects like industry, honesty, sobriety and cleanliness should be taught. A lazy trainman is sure to have accidents; a dishonest one is kept so busy hiding his actions that he will have accidents; one who drinks is not safe on either end of the car, and one who is untidy in appearance will always get the worst of it when he has an accident.

"The things to be done and not to be done in the operation of the cars have been put into a book of rules at some places. This book is growing every day. It would be quite an innovation to do away with rules, and perhaps the time will never come when a large number of rules will not be the most effective way to enforce certain precautions for safety. Most of our systems are so covered with derails, stop signs and caution signs that one wonders if a motorman is supposed to have any brains at all. Now, this is not intended to disparage your book of rules and signboards, but as it is evident they are not a panacea, then it is tenable to take the position that they should be supplemented by teaching. The thousand and one things that your signboards and book of rules will never cover must be put into the trainman's head. Something must be done to develop the railroad instinct, to bring out that quality which distinguishes the good trainman from the impossible trainman, to prepare a man's mind for understanding the why of things.

"Every employee of your street car company should be taught that he is a part of an institution upon which rests one of the most sacred trusts and enduring obligations that a community can delegate. This idea of safety first should permeate the mind of every employee from the messenger boy up. Every man who drives a screw or strikes a spike, tightens a nut, welds a rod, splices a rope, lays a tie, places a rail, hangs a wire, sets a pole, fixes a headlight, tries an axle, tests a wheel, shapes a timber, bends an iron, gives an order or instructs a man should ever have before him the idea that the life and happiness of others depend upon the perfection of his work.

"Every man on the job should be taught his importance and shown his responsibility. The same methods of education suggested in teaching carmen will apply to the men in your power plant, the linemen, the trackmen and the shopmen, and this work should be supplemented by the foremen in the different departments constantly reminding their men of the necessity of careful, conscientious work and fixing in their minds that, while symmetry and line appeal to the artistic sense of a mechanic, 'safe' is the summing up of all that is beautiful from a railroad man's point of view.

"The way to reach the public is to secure an audience. This can be done in the schools, by placards in your cars, by the distribution of blotters and other literature, and by making every conductor on your cars a public safety lecturer. A conductor whose vocabulary consists only of 'Fares please,' 'Step forward please,' is a stick. Teach the conductor to be a veritable caution signal. 'Be careful,' 'Don't rush,' 'Wait until the car stops' and other words of warning, constantly and appropriately given, do an inestimable amount of good at the time given and tend to fix these ideas.

"That the money paid out in settlement of claims is an absolute waste for which the whole community suffers is self-evident. The public should be educated to the fact that the same basic business principles apply in the street railway business as in other businesses; that the expenditures for upkeep, improvements and extensions are limited to the balance remaining after the necessary expenses are paid. It is a fact so patent that it would seem all should know that the greater the amount paid out for accidents, the rougher the track and the less comfortable, as well as the smaller number of cars, yet it has not occurred to everyone. The juryman who renders a large verdict because he 'has it in for the company' doesn't realize that he is 'cutting off his nose to spite his face.' The beneficent effect of education along this line is undeniable, and the best method to pursue in this education merits thoughtful consideration."

GEORGE CARSON ON THE INDEX BUREAU

George Carson, claim agent Puget Sound Traction, Light & Power Company, Seattle, Wash., discussed "The Value of an Index Bureau in Dealing with Fraudulent Claims and Claimants." He said in part:

"An index bureau on this coast would prove valuable in that it would create a clearing house for interchange of information about claimants. The index cards should con-

tain as much information about claimants as possible; such information would be disseminated among the various subscribers, and without doubt in many cases advice would be obtained that could be followed up, leading to other information that would probably either defeat a claim or reduce substantially the amount of settlement, and information might be secured that would lead to criminal prosecution and conviction.

"Co-operation is the watchword to-day. No part of the business of any of our companies can be highly successful without full and complete co-operation on the part of all concerned. Our proposed index bureau would be of value to the extent of the support given by all those concerned with it, and the best kind of support would be the faithful reporting of all claims. Let us organize the index bureau, and having done so, let us co-operate and make it a success and drive the accident fakers out of business."

A. E. BECK ON SAFETY DEVICES

A. E. Beck, claim agent British Columbia Electric Railway Company, Ltd., Vancouver, B. C., presented a paper in which he discussed the subject of safety devices for car equipment and the proper use thereof. He said in part:

"'It must be made difficult for employees to cause accidents or the public to meet with them' is a good rule for the management of railway corporations to have ever in the mind's eye. But carmen will forget and the public will not wait. It is our business to repair in part that element of frailty, the human factor which is ever present when accidents occur.

"For the prevention of accidents we must appeal to the human intelligence as well as depend on mechanical devices; we must have intelligent car equipment both as to men and matter.

"Street cars are now equipped with fenders, lifeguards, wheel shields, headlights, automotoneers, bells, mirrors, gates, folding steps, sliding doors and bars, etc. Well-directed efforts have also been made to so construct the car itself that, structurally, it will conduce to public safety, and these attempts have brought forward many types of cars, each having its own champions. Steam railways have almost universally accepted a standard car pattern, and perfection in this line appears to have been about reached. But we yet await the perfectly constructed street car. Is the standard street car an impossibility? Will the time never come when the man on the street will be as familiar with the structure and safety equipment of a car in Los Angeles as in New York or elsewhere? The provision of such a standard car would be a very desirable factor, as in its construction could be embodied the results of our concentrated endeavors for the prevention of accidents.

"The more serious accidents happen at the 'front end' where they are most difficult to prevent, the time for action being but a brief moment and the danger occasioned by a cause beyond the control of the motorman. Here we must endeavor to lessen the severity of the impact and prevent mutilation. We must have a fender which will fend. But here again we are met with as many types of fenders as there are styles of cars—the Watson, Detrick, Eclipse, Providence, H. B. Lifeguard and others, not overlooking those of 'our own make.'

"The accidents at the 'rear end' are more numerous than any other class. Street car traffic differs materially from steam railway traffic in that the car makes frequent stops and moves along a route where traffic, both vehicular and pedestrian, is congested. Neither does the steam railway have to contend with our latest enemy—the automobile. Street car passengers insist on freedom of entrance and exit and rebel against forcible restriction, yet they demand that the cars be moved with the mobility and speed of this latest and most popular method of private transportation.

"If people would not get on or off a car while it was in motion our work would be greatly lessened, but that is just what they will do, despite our many efforts to warn them and in their rashness and haste they are assisted all too frequently by the too impetuous conductor or motorman.

"Where the summer car is used so much both summer and winter on this coast, and where doors, gates and folding steps are not provided, the writer suggests the installation of an electric bell, operated by either the motorman or conductor by means of a push button and ringing simultaneously at the front and rear of the car, at the points of entrance and exit. This would serve to warn the passenger and also provide for the 'proceed' or 'stop' signal to the motorman. By this means the motorman may signal the approach of a passing car and provision is made for warning those waiting to board a car which is already overloaded as well as the person who approaches the car unobserved from side or rear.

"As a committee of inquiry always in session, we hear complaints, grant compensation, aid the distressed, learn defects, suggest remedies and submit practical measures for the safety of the traveling public and to the advantage and good repute of our respective corporations."

OTHER PAPERS

A paper was presented also by E. M. Grover, district claim agent Northern Pacific Railway, Tacoma, Wash., on the topic "Uplift of the Claim Agent."

G. N. Smith, claim agent Oregon-Washington Railway & Navigation Company, Portland, Ore., read a paper in which he discussed the subject of accidents developing from the use of freight equipment as well as from passenger equipment.

A. E. R. A. COMPANY SECTION ORGANIZED ON PUBLIC SERVICE RAILWAY

The second company section of the American Electric Railway Association was organized by the Public Service Railway of New Jersey at a meeting held in Newark on Friday evening, May 10. The organization began with 156 members, but it is expected to have more than 200 within a short time. The members adopted a constitution similar to that prepared by the Milwaukee company section of the American Electric Railway Association, which held its first regular meeting on April 4, 1912. The following officers were elected: President, Martin Schreiber, engineer maintenance of way; vice-president, J. W. Brown, assistant superintendent transportation; secretary, P. W. Pierson, secretary to the general manager; treasurer, C. B. McCourt, assistant to general auditor; directors, R. E. Danforth, general manager (ex officio); W. F. Feeney, division master mechanic (one year); F. M. Loud, supervisor of signals (two years); H. D. Briggs, assistant general claim agent (three years). The officers and directors constitute the executive council which directs the activities of the section. The following program committee was appointed: Chairman, N. W. Bolen, superintendent of transportation; E. J. Dunne, superintendent of distribution, and W. F. Feeney, division master mechanic. J. L. O'Toole, publicity manager, was appointed chairman of the membership committee, which consists of twelve men, embracing at least one member from each department of the railway.

An announcement regarding the organization of this company section was sent to President Thomas N. McCarter, who is also president of the American Electric Railway Association, while he was on tour in the membership and publicity campaign of the association. In a telegram sent from Billings, Mont., Mr. McCarter congratulated the members upon having organized the section and expressed himself as confident that it would be capable of doing much good. He was glad to see that the Public Service Railway was one of the first companies to give this plan practical indorsement.

Regular meetings will be held the first Thursday of each month at 8 p. m. in the Public Service Building, except during July and August.

PLAN OF EXHIBIT SPACE FOR OCTOBER CHICAGO CONVENTION OF AMERICAN ASSOCIATION

A plan of the space in which the exhibits are to be located at the American Electric Railway Association convention to be held in Chicago, Oct. 7 to 11, 1912, has been made public by the American Electric Railway Manufacturers' Association.

This plan includes several features that are unique in the history of this association. It is intended to make, so far as possible, a classification of exhibits. For instance, all of the frog, switch and track exhibits will be located in the north pavilion. All manufacturers who have a working exhibit or require power will have space in the south pavilion. The signal exhibits will be located in the south straightaway section. The car exhibits will be located on a track near the Stock Yards Inn. This plan of classification of exhibits has been adopted as a natural sequence to the very satisfactory experience with such an arrangement at the meeting of the American Railway Engineering Association held in Chicago in March of the present year, when it was found to be a great convenience for the railway members of the association who were especially interested in one class of exhibits.

A complete plan of the exhibit space is published herewith. As it shows, none of the spaces is outside of the building. All booths of exhibitors will be located in the one building, which is composed of brick, iron and cement with slate roofs. Unlike some of the exhibit places at previous conventions, none of the spaces this year will have canvas tops or curtains and in this respect, with the layout provided, one space will be as good as another.

The letter of H. G. McConnaughy, director of exhibits and secretary of the Manufacturers' Association, explaining the plan, says in part:

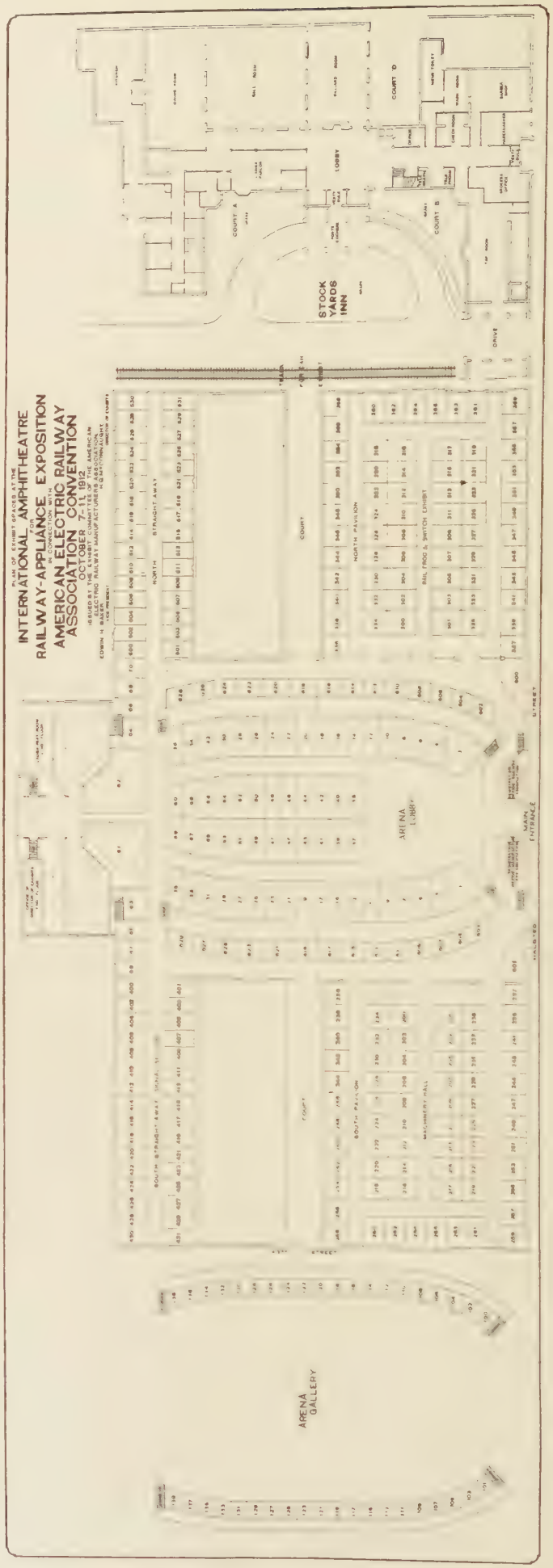
"You will note that the layout is exceptional. This, with the arrangements made with the parent association regarding attendance during the convention, makes one space or location just as good as another; but, to keep the cost near that paid at Atlantic City, it will be necessary to classify the exhibits to a certain extent, and the exhibit committee hopes to have your co-operation. If so, we feel sure that we can accomplish it; besides this, it will go a long way toward a perfect and complete exhibit in all details.

"The following is a general idea of what we should like to accomplish and your committee hopes that you will follow this as nearly as possible when asking for space. The booth plans and decorations are entirely new and different from anything ever attempted anywhere. We have never had so many inquiries for space at this time, and the Western manufacturers are very enthusiastic; besides, we want to have the best and largest exhibit again.

"We shall carry out so far as possible for the arena the plan adopted some years ago for the front building at Atlantic City, making this a general meeting and reception place.

"The arena gallery or mezzanine floor is only about 10 ft. from the arena floor and will overlook the entire arena, having steps at each end. Owing to the general plans for this building it will be impossible for anyone to exhibit here who requires wall space or whose exhibits will be higher than 36 in. above the floor. The aisle will be on the wall side. Booths will have dividing rails, back rail, but no front rail or panels.

"We have designed and laid out the north pavilion for a frog, switch and track exhibit with decorations to correspond. There will be dividing rails between all spaces, both at rear and sides, but no front panels or railings, which will make this an unusually attractive room for such a display. We hope all such manufacturers will make application for this room.



"All manufacturers having a working exhibit or requiring power will request space in the south pavilion. Special attention has been given to the decorations. There will be no side rails or front panels. The spaces will be marked on front corners by an ornamental flower box, also in the center of each dividing line between the front and rear of booth.

"The decorations in the north straightaway section will be unusual and as each space has a wall it will be a good opportunity for manufacturers who require wall space. There will be dividing rails but no front rails or panels.

"We have planned and designed the south straightaway section for our signal exhibit. This room has a view from door of from 300 ft. to 500 ft., making it an unusual room for signal displays. The ceiling is about 25 ft. There will be dividing rails between spaces but no front rails or panels; it also has a wall space.

"The spaces under the arena gallery, facing the north and south pavilion and fronting on the aisles from the rooms through which everyone must pass, are very desirable. The ceiling slopes from 8 ft. at back to about 15 ft. in front. There will be dividing rails between spaces, but no fronts.

"All applications received by June 10 will be given equal preference. After that date they will be considered in chronological order. Let us all get together for the best, largest and finest exhibit ever held."

ELECTROYSIS DISCUSSION IN CHICAGO

The committee on gas, oil and electric light of the City Council of Chicago has recommended for passage a drastic ordinance designed to prevent damage to buried metallic structures from electrolytic corrosion due to electricity escaping from electric railway return conduits. This ordinance was drawn up by Ray Palmer, city electrician, and has received the approval of the committee, although it has not been presented to the City Council. At a meeting of the committee held on May 16 lawyers who represented the surface and elevated railway companies were present in an endeavor to induce the committee to modify the severe requirements of this ordinance.

W. W. Gurley, Chicago Railways Company, said that literal compliance with the ordinance would require the companies to spend about $25,000,000. The railway experts believed that for all practical purposes the difficulties could be removed for much less. William H. Arthur, representing the elevated railway companies, thought the cost to each of the elevated companies might be from $5,000,000 to $7,000,000.

Mr. Palmer, city electrician, said that under the present ordinance the companies are supposed to operate their return circuits with a maximum allowable drop of 25 volts, whereas readings showing a drop as high as 80 volts have been obtained on tests made during recent electrolytic surveys. The maximum allowable drop under the proposed ordinance is 12 volts. In England this limit under the Board of Trade rules is 7 volts, and in Germany it is 2.5 volts average, or 7 volts maximum. If the English electric railways can be operated with a maximum drop of 7 volts in the return circuits, the same precautions can be used in Chicago. The proposed "drainage" system would not prove efficient. To install it was simply putting off the evil day.

Alderman Long of the committee said he thought the companies might be allowed a little more time. A letter received from the Board of Supervising Engineers, Chicago Traction, mentioned the elaborate investigation it has made of electrolysis and stated that it believed the rehabilitated portion of the street railway systems of Chicago to have far better return circuits than those of most other American cities. On motion of Alderman Kearns the disposition of the ordinance was laid over one week. The companies were told that they might bring in their experts and would have an opportunity to lay a counter proposition before the committee.

COMMUNICATION

SPARKING AT COMMUTATORS

May 13, 1912.

To the Editors:

We are operating a twenty-minute railway service with single-truck cars, equipped with GE-1000 motors and K-10 controllers. These cars are single-ended and have a 5 per cent grade to climb within ¼ mile of the power house. The voltage is 500 to 550. We have been operating single-ended cars for the last seven years. Lately we have had considerable trouble from sparking of the commutators and arcing over to the brush holder, which is at the left when one is facing the commutator. This has happened so often that it is almost impossible to keep a car on this run. We have tried several remedies without avail.

SUBSCRIBER.

Your trouble may be due to some defect in the line or track as well as in the car equipment itself. Connect a voltmeter from trolley to ground on one of your cars and run the car over the line, noting carefully any jumps in voltage that might be caused by broken or cut bonds. If your lines have been extended without feeders it may be that the voltage is low at the end of the lines. The increased current which is taken by the motors while operating at the reduced voltage causes overheating, and this results in flashing when sections of higher voltage are reached.

Are the commutators or brush holders of your motors worn to such an extent that you have found it necessary to shim the brush holders? If so, your brush holders may not be properly located with respect to the field coils, or they may not be spaced the proper distance apart. Brush holder shunts should be properly installed and care taken not to allow motors to operate without shunts. Are the commutators of your motors tight or do they show signs of high mica? Do you slot your commutators and are you sure you are using brushes with proper conductivity to meet your service requirements? Many roads have eliminated flashing on their motors almost entirely by slotting the commutators, using a high-grade carbon brush and making certain that the brush tension is uniform and properly adjusted to meet their operating conditions. Among many others the following articles on brush tension and slotting of commutators have been published in previous issues of the ELECTRIC RAILWAY JOURNAL and will give you further information on this subject: Volume XXXII, pages 432, 927, 1029; Volume XXXIV, pages 428, 718, 719, 1140, 1143; Volume XXXV, pages 613, 653, 910; Volume XXXVI, page 849; Volume XXXVII, pages 556, 1008; Volume XXXIX, pages 536, 570, 582.

For turning steel after hardening or for producing a fine polish on aluminum, hard fiber, brass or copper the sapphire is said by H. L. Thompson in the *American Machinist* to be a most desirable type of cutting tool. The sapphire can be ground to the proper form for cutting by means of a lapping wheel carrying diamond dust. By polishing it with extremely fine diamond dust, it can be given an exceedingly fine cutting edge, which is retained even under heavy cuts at high speed. When properly ground and polished it is stated that a sapphire cutting tool will produce practically the same results which can be obtained by the use of a diamond, although the sapphire can be much more easily brought to shape and is of course much less costly.

MEETING OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS AT SCHENECTADY

A regular meeting of the American Institute of Electrical Engineers was held at the Mohawk Golf Club, Schenectady, N. Y., on May 17. The meeting was conducted under the auspices of the Schenectady section. When President Dunn called the opening session to order about 300 people were present. Mayor George R. Lunn of Schenectady made an address of welcome, to which Dr. C. P. Steinmetz responded. The morning program included the presentation of papers and discussion. The afternoon was devoted to trips of inspection to the Schenectady plants of the General Electric Company and the American Locomotive Company and to the Schenectady Water Works.

Dinner was served at the club house in the evening and speeches were made by Past-president Scott, P. M. Lincoln, W. B. Potter, Prof. J. P. Jackson and President Dunn. The evening technical session followed. An abstract of the discussion on the papers which were of particular interest to electric railways is published herewith. The papers by C. B. Eveleth, General Electric Company, on "Some Impressions of the Electric Traction Situation in Europe," and by S. T. Dodd, General Electric Company, on "Freight Train Tests on an Electric Interurban Railway," were published in abstract in last week's issue of the Electric Railway Journal.

DISCUSSION ON MR. EVELETH'S PAPER ON THE ELECTRIC TRACTION SITUATION IN EUROPE

B. G. Lamme, in opening the discussion, compared electric locomotive practice in Europe with some of the notable types of locomotives in service in this country, emphasizing the much greater drawbar pull for both maximum and continuous service here. He pointed out that the combined locomotive development in all countries of Europe does not equal in capacity that on any one of several large trunk line electrifications in America, such as, for example, the New Haven system with 106 locomotives of 146,000 hp total rating. Referring to the use of cage-wound rotors in alternating-current railway practice, Mr. Lamme said he favored them only for special conditions. The English experience with both German and American locomotives was decidedly in favor of the latter. The three-phase locomotives which had been so popular in Germany were subject to rather serious vibration, due to pulsations of torque, but this was not serious because the drawbar pulls were relatively low. High peripheral rotor speeds seemed to have diminished appreciably the vibration on 15-cycle single-phase locomotives. He objected to some of the German methods of locomotive control, such as rocking the brushes or using induction regulators in place of the controllers now standard here, characterizing such methods as fads. He considered that the difficulties of commutator design in 3500-volt direct-current motors were so serious as to make it very advisable, at such pressures, to employ two motors in series.

E. F. W. Alexanderson, in continuing the discussion, pointed out that the latest practice in European locomotive design was following the lines of established American practice, which represented the most advanced state of the art.

C. F. Scott described the 22,000-volt three-wire distribution scheme which will be used on the extensions of the New Haven system, stepping up from the generator pressure of 11,000 volts with auto-transformers.

W. B. Potter spoke of the economic value of self-propelled motor cars for use on trunk line branches with thin traffic, where electrification would be prohibitive in cost. He referred also to the advantages of electric locomotives with geared motors and side rods, describing the general features of a single-phase, four-motor, type 4-8-4 locomotive which the members had had an opportunity to inspect during the afternoon at the plant of the American Locomotive Company. He also described the main features of a direct-current, 90-ton, eight-motor articulated locomotive, designed for a maximum tractive effort of 60,000 lb. and capable of hauling a 1000-ton train at 60 m.p.h. for the New York Central & Hudson River Railroad.

DISCUSSION ON MR. DODD'S PAPER ON FREIGHT TRAIN TESTS ON AN INTERURBAN RAILWAY

Prof. C. F. Scott complimented the author on the thorough presentation of a valuable set of tests for the use of traction engineers, and asked if the record curves shown on the diagrams were traced automatically or plotted from periodical readings.

Mr. Dodd replied that an automatic curve tracer was employed in all cases.

STUDIES OF PROTECTION AND PROTECTIVE APPARATUS FOR ELECTRIC RAILWAYS

A paper on this subject was presented by E. E. F. Creighton, F. R. Shavor and R. P. Clark. It discussed protective apparatus for electric railways and the application of aluminum arresters to this class of work. The authors investigated first the relation of car wiring to protection in general, and found it imperative to avoid placing any wire that carried lightning current near or parallel to any of the wiring in which damage might occur as the result of induced charges. The experiences in applying aluminum arresters to the system of the Denver (Col.) City Tramway, where lightning disturbances of the utmost severity are experienced, were described in detail. A table was presented showing that whereas 102 armatures, out of 279 cars, were damaged in 1909, the substitution of aluminum arresters on the cars reduced the number of damaged armatures to one during 1911, out of 304 cars. In the same interval 193 cars had been rewired. In discussing the choice of the proper type of arrester for a given situation, the authors pointed out that the direct-current aluminum arrester, directly connected without gaps or resistors, gave the most efficient protection known, and was especially applicable where the total elimination of risks was very important, as in electric locomotives. When this arrester was so connected there was a constant leakage of about one-thousandth of an ampere, or one-half watt, which produced appreciable wear on the aluminum plates and raised the cost of maintenance. Since the arrester required only occasional charging, the use of a charging gap which automatically closed the circuit at intervals would prolong the life; a limiting resistance was placed in series with the gap to meet the condition of a partially dissolved film, which might arise if the arrester was left out of service a few weeks. The rest of the paper was devoted to a description of the re-design of the early magnetic blow-out type of arrester, illustrated by numerous oscillograms which constituted an important part of the work.

James P. Jackson stated in the discussion that lightning damage to railway motors probably occurred most frequently on rewound machines. While admitting that the electrolytic direct-current arrester was undoubtedly the most effective type yet developed, he asked the authors if these arresters did not require considerable care and attention for maintenance. In referring to the wet and dry string efficiency, he asserted that the most severe lightning sometimes occurred just before the rain commenced to fall, which made the dry arc-over test of considerable importance.

In closing the discussion R. P. Clark explained that the aluminum arrester had to overcome much early prejudice. When connected directly to the line, without intervening gaps or resistors, it had a comparatively short life. The addition of a gap in series with resistance lengthened the life and diminished the cost of maintenance, without materially impairing the efficiency for car service, unless the lightning disturbances were excessively severe.

NEW DAYTON CARS WITH NON-PARALLEL AXLE TRUCKS

The People's Railway Company, of Dayton, Ohio, one of the subsidiary properties of the American Railway Company, recently received ten cars from the St. Louis Car Company, which are a departure in the design of equipment for city railway service. The novel features of the design include, essentially, a 40-ft. semi-steel car body with seats for forty passengers, mounted on a single truck. These features in the design were made possible by employing the Warner non-parallel axle truck, described in the ELECTRIC RAILWAY JOURNAL of Feb. 3, 1912, with a 12-ft. wheelbase.

The People's Railway Company, with George C. Towle as general manager, operates 114 cars on 31 miles of track in Dayton. The new equipment will supplement that already in service and was purchased largely as a result of tests made by the City Railway Company, of Dayton. These tests were made in order to determine the comparative current consumption between a car equipped with Warner non-parallel axle trucks and one equipped with Standard 0.45 maximum traction trucks. A description of the cars used and the data obtained are as follows:

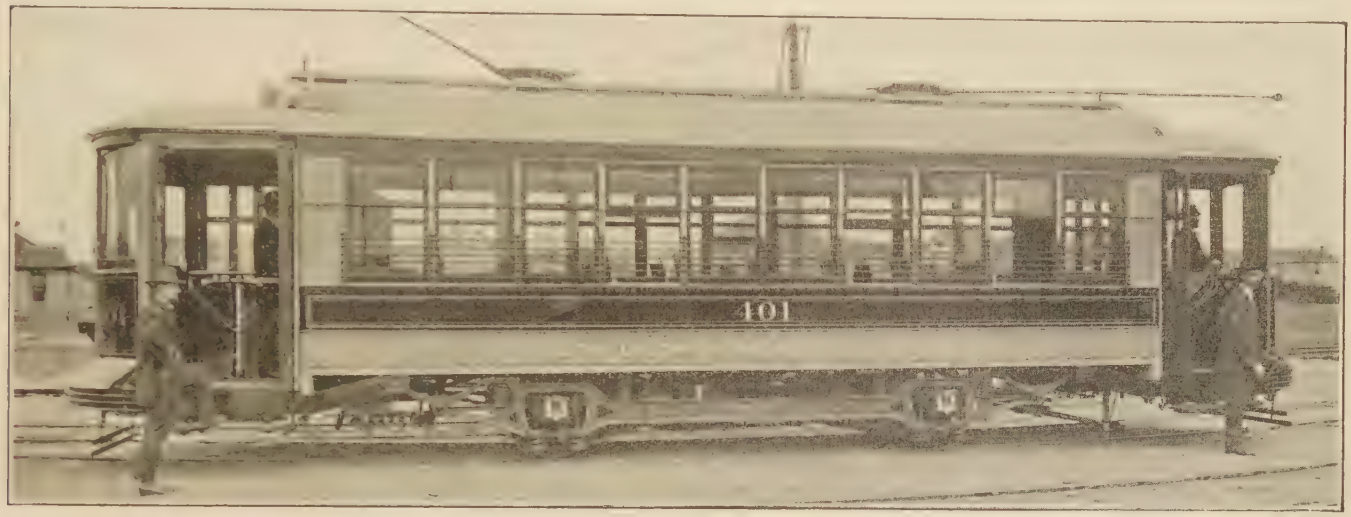
Car No. 302, with two GE-67 motors and Warner non-parallel axle truck, 10 ft. wheelbase, length of car body over all, 35 ft. 8 in.; seating capacity, forty; total weight of car, 26,300 lb.

Car No. 202, with two Westinghouse 306 motors and Standard 0.45 maximum traction truck; length of car body over all, 43 ft.; seating capacity, forty-eight; total weight of car, 33,800 lb.

TEST NO. 1, DEC. 24 TO 31, 1911, WITH CAR NO. 302.	
Total power consumption in kilowatt-hours	2060
Total mileage	1247
Kilowatt-hours per car mile	1.652
Total number of passengers carried	6432
Passengers per car mile	5.158
Kilowatt-hours per passenger car mile	.320
CAR NO. 202.	
Total power consumption in kilowatt-hours	2330
Total mileage	1249
Kilowatt-hours per car mile	1.865
Total number of passengers carried	5778
Passengers per car mile	4.626
Kilowatt-hours per passenger car mile	.403
TEST NO. 2, FEB. 13 TO 20, 1912, WITH CAR NO. 302.	
Total power consumption in kilowatt-hours	1889
Total mileage	1247
Kilowatt-hours per car mile	1.515
Total number of passengers carried	6370
Passengers per car mile	5.108
Kilowatt-hours per passenger car mile	.297
CAR NO. 202.	
Total power consumption in kilowatt-hours	2372
Total mileage	1256
Kilowatt-hours per car mile	1.888
Total number of passengers carried	6541
Passengers per car mile	5.208
Kilowatt-hours per passenger car mile	.363

The general dimensions of the new car are as follows:

Length of car body over corner posts	26 ft. 6	in.
Length of platform inside	5 ft. 6	in.
Length of platform from end of car body over dash	6 ft. 0	in.
Length from outside of dash to outside of bumper	10	in.
Length of car over all	40 ft. 2	in.
Extreme width over all	8 ft. 2	in.
Height from top of rail to under side of sill	2 ft. 7	in.
Height from under side of sill to top of roof	8 ft. 6⅞	in.
Wheelbase of truck	12 ft. 0	in.
Height from under side of sill to top of arm rail	2 ft. 7	in.



Dayton Car—Side View Showing Non-Parallel Axle Truck and Turnstile on Rear Platform

BOTTOM FRAMING

The under frame is steel throughout and consists of 5-in. x 3-in. x ⅜-in. angles in one piece, bent around the corner posts, forming continuous end sills and side sills. The cross bars are 4-in. channels, except the first one back of the end sill, which is a 6-in. channel. The steel girder plates which form the side sheathing are in one piece, 29 in. x 3/16 in., bent around the corner posts and joined in the center of the end sill by a splice plate. An oval steel molding was fitted along the center line of each girder plate to give the effect of two panels. The diagonal braces are 2½ in. x ⅜ in., and the top chord of the girder plate is formed by uniting a 2-in. x ⅜-in. continuous piece to it to extend from corner post to corner post.

BODY FRAMING ROOF AND BONNETS

The car body is framed for ten windows on each side. The posts are made of 2-in. x 2-in. x ¼-in. T's, running continuous from side sill to side sill, forming the roof carline. The bulkheads are of lattice construction, having 2-in. x 2-in. x ¼-in. T-irons bent to form the door opening and the corner posts and carlines, laced with 1½-in. x 3/16-in. lattice bars. The specifications required that all steel framing receive one coat of red lead before assembling and all wood framing one coat of white lead.

The roof is the plain arch type, sheathed with ⅜-in. matched poplar roof boards, painted with one coat of white lead and covered with 8-Cb cotton duck. A trolley board extends the full length of the roof and provision was made for installing a United States No. 14 trolley base. The bonnets are detachable and are set below the car-body roof so as to permit the installation of automatic bulkhead ventilators. The setting of the bonnets below the car-body roof relieves the bald appearance of the front end and materially improves the appearance of the whole car. The sheathing and roof covering on the bonnets are the same as on the car-body roof.

PLATFORMS

The platform knees are 7-in., 9¼-lb. channels bent to meet the conditions of the step openings. The ends of the platforms have been fitted with Hedley anti-climbers. Narrow Universal safety treads have been placed on the edge of the platform and entrance to car body. All flooring is 13/16-in. x 3¼-in. matched yellow pine and the cen-

ter aisle was depressed so as to provide for a maple floor mat.

VESTIBULES

The vestibules were built for double-end operation and are of the round type. Each has three sashes and is fitted with pay-within folding doors, operated by the motorman or conductor. The general arrangement of the vestibule, showing the location of the controller, air valve, turn-in control and hand brake, is shown in the illustrations. The conductor's control stand occupies a space of 18 in. at the center of the car-body entrance. Four pipe stanchions have been located on the platform so that passengers will be able to reach the grab handles when the doors are open without being blocked by the edges of the doors. The width of the door openings is 3 ft. 5⅝ in., and the height of the first step is 15 in.

The turn-in system of fare recording which was installed on these cars was invented by John F. Ohmer, president and general manager of the Ohmer Fare Register Company, and described in the ELECTRIC RAILWAY JOURNAL of Dec. 17, 1910. The first turnstile register combination was installed on one of the cars of the People's Railway Company, Feb. 20, 1911, and has been in constant daily operation since that time. The fact that the turn-in car is popular and does not delay traffic was made evident when there were over 2000 passengers recorded in a single day. The fact that the railway company has arranged to equip all the cars with this device is good evidence of the satisfaction given in the trial operation.

SEATING ARRANGEMENT AND LIGHTING

Eight reversible wooden-slat seats have been installed on each side of the car. They measure 35 in. over all and are provided with corner grip handles and foot rests. Four stationary corner seats of the same design were installed in the four corners of the car body.

All car-body wiring is run in conduit and artificial illumination is obtained from 20-watt, 60-volt Mazda lamps. The lamps are in two series of eleven lamps each. Ten lamps have been installed on each side of the car interior, and the eleventh lamp is situated over the steps in the vestibule and is controlled by a switch operating with the door mechanism.

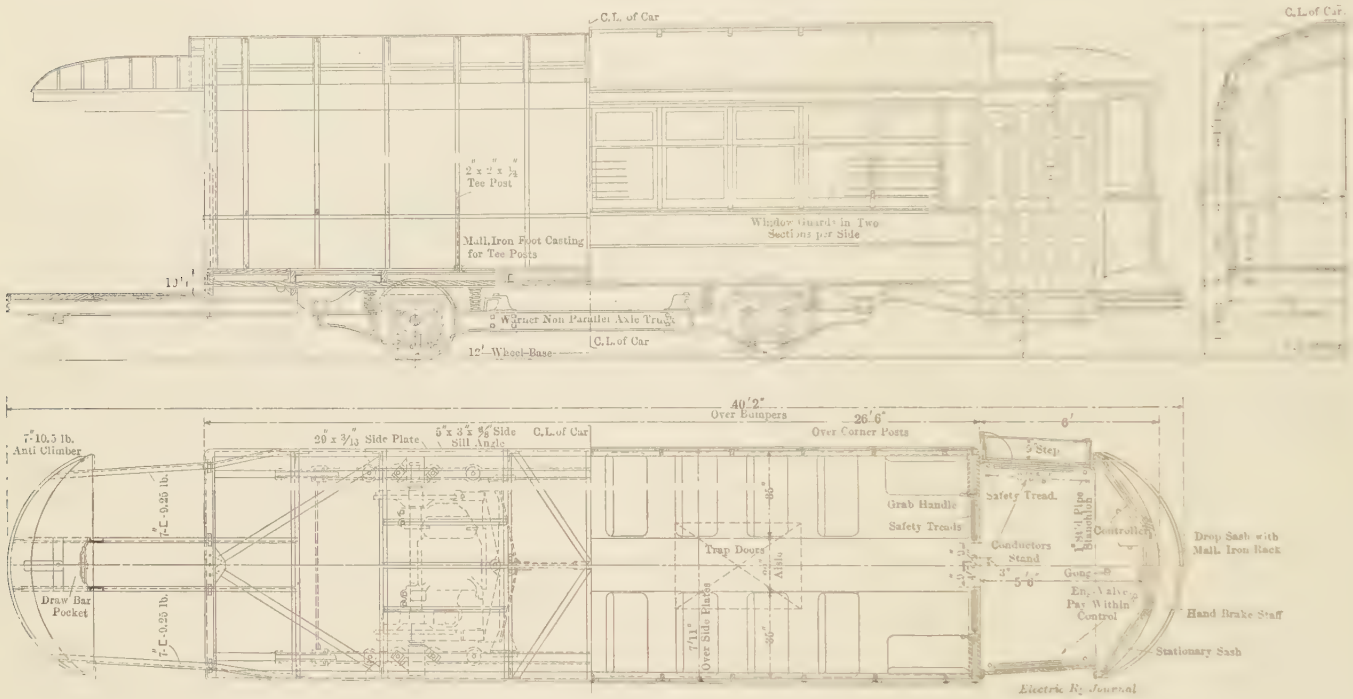
TRUCKS AND MOTORS

The truck, as noted before, is the Warner non-parallel-axle type with a 12-ft. wheelbase. The essential features in the truck design include two axles connected to a truck frame by means of swing link hangers from the oil boxes through the coil springs supporting the side frame. The axles are connected at the center line of the truck by swivel joints through the motor supports, which permits the axles to assume non-parallel positions independent of the center line of the truck.

The truck dimensions are as follows:

Wheelbase	12 ft. 0 in.
Gage	4 ft. 8⅛ in.
Width of top frame centers	6 ft. 3 in.
Height from rail to top of top bar, with canopy light	30 in.
Diameter of wheels	33 in.
Tread	2½ in.
Flange	⅞ in.
Journal, MCB	4 in. x 7 in.
Weight of truck	7250 lb.

The brake arrangement is the double-truck type, hung between the wheels. The brake hangers and brackets are the St. Louis Car Company anti-chattering type, operated



Dayton Car—Plan, Elevation and Sections

by a Westinghouse straight-air equipment. Each truck is fitted with four semi-elliptic springs, eight swing-link hanger coil springs and eight top-bar coil springs of suitable dimensions to receive the weight of the loaded car body. The wheels are of nickel chrome composition, made by the National Car Wheel Company and of the People's Railway Company's standard dimensions. The axles are hammered steel of the Pennsylvania Railroad Company's analysis, turned and key-seated to accommodate Westinghouse 306 40-hp to 50-hp interpole motors, except that the size of the axle at the motor bearings is 4½ in. and at the gear seat 5½ in. in diameter.

An order has just been placed by the Virginia Railway & Power Company, Richmond, Va., with the General Electric Company for the complete electrical equipment of the 27,000-kw power station which the railway has under construction at Richmond. The initial order for equipment includes a 9000-kw, 60-cycle Curtis turbo-generator unit, two 75-kw exciters, three 1000-kw synchronous motor-generator sets, two 20,000-cu. ft. blower sets and complete switchboard apparatus. A description of this new station appeared in the ELECTRIC RAILWAY JOURNAL for May 20, 1912.

THE SYNCHRONOUS BOOSTER CONVERTER FOR VARIABLE D.C. VOLTAGES

The ratio between the alternating-current and direct-current voltages of a given elementary rotary converter is an approximately constant figure which varies only within a very few per cent from no load to full load. In consequence some addition to the ordinary converter or some auxiliary apparatus is necessary if it is desired to obtain a variable direct-current voltage. The important commercial methods of effecting this condition are as follows:

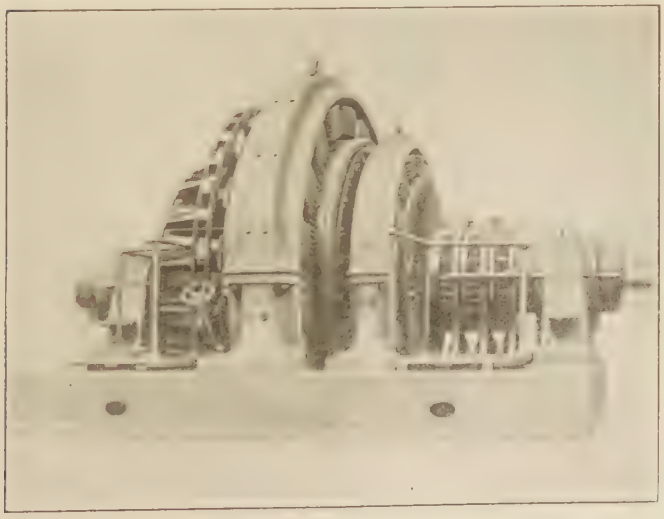
1. With an alternating-current synchronous booster.
2. With an alternating-current potential regulator or regulating transformer.
3. With a direct-current booster.
4. With a split-pole converter.
5. By automatic compounding.

All of these methods have been applied with more or less success. The synchronous booster method is now being advocated by the Westinghouse Electric & Manufacturing Company for certain applications, and is being used so extensively that an explanation of the principles and of the construction of the synchronous booster rotary converter is of timely interest.

A synchronous booster converter consists of a standard rotary converter having on its shaft the armature of an alternating-current generator which has the same number of field poles as the converter. The generator armature windings are connected in series with the taps between the collector rings and the converter armature winding.

By varying or reversing the field excitation of this alternating-current generator, the alternating-current voltage impressed on the rotary converter proper can be increased or decreased as desired, the direct-current voltage delivered by the converter varying accordingly. The machine is simply a combination of two standard and thoroughly tried-out pieces of electrical apparatus.

By means of a reversing switch in the field circuit the polarity of the booster field may be reversed without opening the field circuit and the generated voltage made either to "buck" or to "boost" the voltage impressed at the collector rings. The alternating-current voltage applied to the converter armature winding may be varied, therefore, over a range equal to twice the voltage range of the direct-connected generator, and the direct-current voltage delivered by the converter will vary in proportion. The converter field current must, however, be varied as the applied alternating-current voltage varies, in order to maintain a 100 per cent power factor input.



Synchronous Booster Converter with Generator Field Supported on Bedplate

While the normal voltage for a converter of this type is midway between the extreme of its range, or that voltage developed by the converter when the booster field is not excited, the fact that it may be operated over a considerable range of voltage makes it, in general, a somewhat larger machine than the simple converter. This increase in size is necessary to prevent excessive saturation of the iron at the maximum voltage and so that the commutation will be good at the minimum voltage.

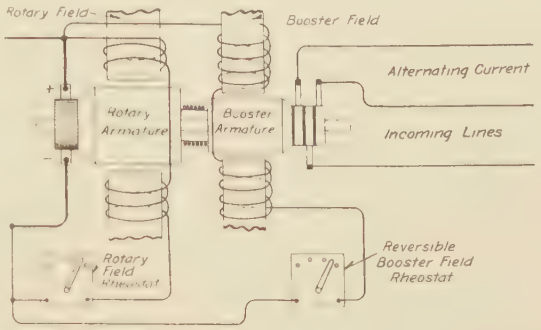
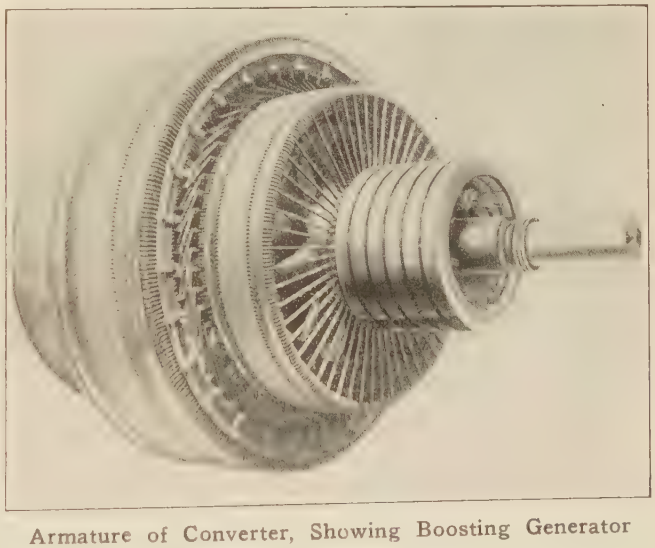


Diagram of Synchronous Booster Connections

The voltage variation can be made any current desired by properly proportioning the boosting generator capacity, although for extreme voltage ranges special rotary converters are required. The usual variation is a total range of 30 per cent; that is, 15 per cent below and 15 per cent above the average voltage for which the rotary converter is designed. This range is obtained by a boosting generator with a capacity of 15 per cent of that of the rotary converter.

Compared with the transformer or induction regulator method, the booster method has the advantage that there is one unit only which requires minimum floor space and cable connections and that no dangerous forces are developed between the stator and the rotor if the converter is connected to the alternating-current line while out of step.

Compared with the so-called regulating-pole or split-pole converter, the synchronous booster converter has the advantages of higher efficiency, particularly at the lower voltages, and better commutation, particularly at the maximum voltages and maximum load, when good commutation characteristics are especially essential. This advantage is further increased by the possibility of using commutating poles whenever large capacity or other conditions make commutating poles advantageous. The synchronous booster also has smaller weight and floor space requirements, particularly for 60-cycle units.



Armature of Converter, Showing Boosting Generator Mounted on Converter Shaft

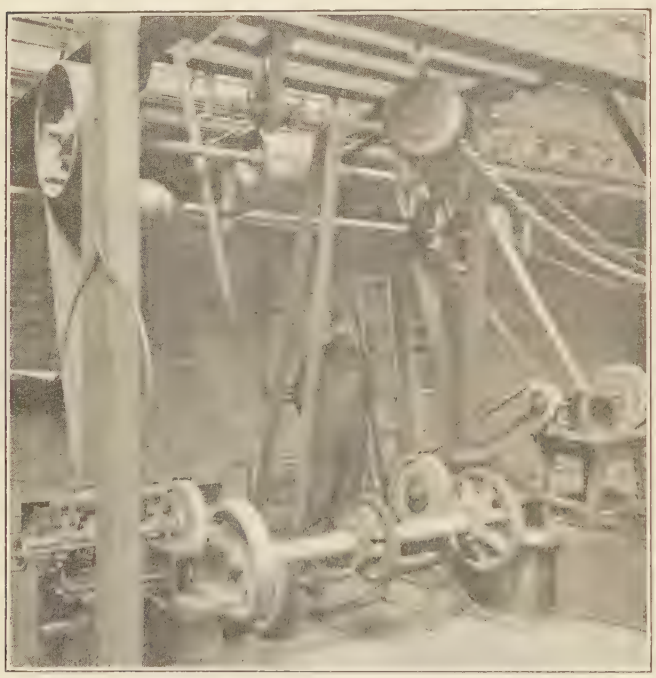
A revolving armature booster is used by the Westinghouse Company in preference to a revolving field booster to obtain a compact two-bearing unit which requires minimum floor space and minimum current-collecting parts, as well as much greater simplicity in the connections between the converter and booster armatures.

Synchronous booster rotary converters are well adapted for any application for which a relatively wide variation, either automatic or non-automatic, in direct-current voltage is required. Starting may be effected by any of the methods applicable to ordinary rotary converters, namely, alternating-current or direct-current, self-starting or motor-starting. The alternating-current, self-starting method, however, is the Westinghouse standard.

The synchronous booster converter is simply the combination of a standard rotary converter and an alternating-current generator of a standard form, and it has no details of construction essentially different from those encountered in apparatus of these two classes. The only novelty is in their combination. The booster generator frame may be supported either from the rotary converter frame or from the bedplate. If necessary, a booster converter can be built with a vertical shaft.

GRINDER FOR PONY WHEELS USED IN NEW YORK

The Third Avenue Railway, New York, uses solid steel wheels for all its passenger cars except the pony wheels, which are of cast iron. When these pony wheels developed flat spots or other defects which could be corrected by regrinding, they were sent to an outside machine shop at an average cost of $2.50 per pair. This expensive method prevailed until the company installed its own wheel-grinding equipment by purchasing from the Hampden Corundum



Wheel Grinder Truing a Pair of Pony Wheels

Wheel Company, Springfield, Mass., a car wheel grinder of the type shown in the accompanying illustration. The average capacity of this machine as used by this railway is eight pairs of wheels a day, which corresponds to a labor cost of 25 cents per set. In general, the saving effected by this tool has been so great that it paid for itself in about three months.

The machine, as shown in the illustration, has two independent beds which are mounted on a concrete foundation. The wheels are rolled into adjustable bearings. A positive drive of about 10 r.p.m. is obtained by clamping a split sprocket with bushings on the axle, the primary drive being from belting. The grinding wheels are mounted on 2-in. spindles which are run in two dustproof sleeves each 10 in. long. A belt tightener and weight help to give the full power of the 6-in. belt to the two 18-in. x 2½-in. grinding wheels. A feature of the wheels is the use of the manufacturer's "Hub" safety collar which prevents pieces of a wheel from flying in case of breakage. The machine has adjustable feeds throughout, and the feed across the face of the wheel is reversible. The same tool may be used for wheels ranging from 18 in. to 36 in. in diameter.

ELECTRIC DRIVING OF SCREW SPIKES

The preservation of wooden ties has received a great deal of attention in late years, and one of the most important results of this has been the introduction of the screw spike. Originally the most serious objection to the use of screw spikes lay in the fact that no economical means for applying them was available, and in consequence an electrically driven spike driver was put on the market by the Chicago Pneumatic Tool Company about four years ago, for the purpose of inserting these spikes quickly and cheaply. The first installation of thirty-five of these machines was used by the city railways of Chicago in the rehabilitation of their lines. Their tools were very successful and a number of other electric railways have adopted them. The Coney Island & Brooklyn Railroad Company has, in fact, made the electric-driven screw spike standard for all of its new construction.

The device consists of a specially wound portable electric motor with suitable gearing for reducing the speed. The electric current is taken from the trolley wire or third rail, as the case may be, the circuit being controlled by means of a magnet which, mounted on a pole, is hooked over the trolley wire. This switch itself is under the direct control of the operator, through the medium of two push buttons on the driver itself, so that the tool may be started or stopped at the will of the operator. In regular operation the tool is started by the operator and automatically stopped when the spike is driven home by the opening of the magnet switch. The switch is adjustable so that spikes may be driven just as tight as occasion may require. In general practice a hole of the same diameter as the bottom of the thread on the spike is drilled in the tie, by means of a small drill, which also takes current from the trolley wire. The man operating this drill keeps considerably in advance of the men driving the spike. On the very large spikes two men are usually employed on the driver to take care of the heavy torque which is developed at the time the spike is driven home. The actual time of driving the spike is from three to four seconds, and in service from 400 to 500 spikes per hour are applied by one gang.

Motor-Driven Spike Driver

The accompanying halftone shows a man driving a spike with the electric spike driver. In back of this operator is shown a man drilling the holes for the spikes, and in the upper part of the illustration are shown the magnet switches hooked over the energy-supplying trolley wire.

News of Electric Railways

Rapid Transit Progress in New York

The report of the transit committee of the Board of Estimate of New York was made public on May 22, 1912. It indorses the settlement reached recently with the Public Service Commission as mentioned in the ELECTRIC RAILWAY JOURNAL of May 18, 1912, page 847, and explains the advantages which the city will obtain from the dual subways system, whereby the new routes are to be divided between the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company. At the same time that the report was presented to a special meeting of the Board of Estimate President Mitchel of the Board of Aldermen submitted a memorandum opposing the report on the ground that the interests of the city were not properly guarded in the bargain that is to be made with the companies.

At another meeting which was to be held on May 24, 1912, the report was expected to be adopted by the votes of all the other members of the Board of Estimate and Apportionment.

It is explained that there is still to be considered the action that the Court of Appeals may take on the matter of payment of preferentials to the companies, but it is pointed out that this is a question solely affecting the terms that the city may make with the companies and has no relation to the merits of the plans proposed in the report. It is added that the approval of the construction and operating plans at this time would anyway "prove ultimately an economy of time if action is taken at once and if the Public Service Commission may thus be enabled to proceed with the completion of the proposed operating contracts with the assurance that its action will be ratified by the Board of Estimate when presented for the final consideration of the board.

The magnitude of the proposed new system, it is explained, is indicated by the fact that the total road mileage of rapid transit routes, subway and elevated, now serving the city, exclusive of the Hudson & Manhattan Railroad, will be increased in round figures from 66 miles to 172 miles. In plotting the new lines, the report states, the old plan of dependence upon straight north and south routes has been broken and the beginnings laid for a radial system that should go far in shaping the city's better development. The general scheme was to provide for subways wherever the congestion of traffic and consideration for the freedom of street surfaces seemed to warrant. Where subways appeared to be too expensive, elevated lines which are to cost from one-third to one-fifth as much are to be employed.

The Public Service Commission of the First District of New York on May 20, 1912, approved five more of the rapid transit routes embraced in the agreement of May 14 for the dual plan of subway construction and operation in New York. One is for the Eastern District line of the Brooklyn Rapid Transit Company along Wyckoff Avenue, which will connect with the tunnel under the East River at Fourteenth Street, New York, and with the Broadway subway. Two other lines which will go to the Brooklyn Rapid Transit Company are those resulting from the elevation of the present service lines in New Utrecht Avenue and Gravesend Avenue, which are to be transferred into city lines.

Two lines have also been approved which will go to the Interborough Rapid Transit Company, one of these being for a connection between the Steinway tunnel in Long Island City, north to the Queensboro Bridge plaza, where it will connect with the elevated lines of Queens, and the other is for a connection between the present West Farms branch of the subway and the proposed White Plains route at Boston Road and 179th Street.

Growth of Transportation Facilities in Chicago Since 1850

The City Club of Chicago has prepared an exhibition of plats showing the growth of transportation facilities in Chicago since 1850. A number of maps of the city showing proposed methods of relieving congestion on the steam railroads as well as on the surface and elevated railways, are among the exhibits. The following papers and discussions have been arranged for members and non-members following the noon luncheons on the dates given:

"Supplying the Energy Requirements of the Community," by Samuel Insull, president of the Commonwealth Edison Company, May 23.

"Chicago, the Transportation Focus," by Prof. J. Paul Goode, of the University of Chicago, May 24.

"The Transportation Proposals of the Commercial Club," by Frederic A. Delano, president of the Wabash Railroad, May 27.

"Freight Interchange in Chicago," by L. T. Jamme, chief engineer of the Chicago Transfer & Clearing Company, May 29.

"Freight Collections and Deliveries," by Charles J. Harth, manager of the J. C. Zipprich Teaming Company; Oscar F. Bell, traffic manager of the Crane Company; C. O. Frisbie, traffic manager of Armour & Co.; James J. Wait, of the Merchants' Lighterage Company, May 30.

"Railway Electrification," by W. F. M. Goss, director of the engineering department of the University of Illinois, June 3.

"Passenger Subways," by Alderman Eugene Block, chairman of the City Council committee on local transportation; John Ericson, chairman of the Harbor and Subway Commission; Thomas F. Deuther, secretary of the Greater Chicago Federation, and Charles K. Mohler, consulting engineer, June 4.

"The Subsurface Pipe and Wire Network," by Ray Palmer, city electrician; August Gatzert, chairman of the Association of Commerce committee on downtown streets, and Langdon Pearse, hydraulic and sanitary engineer of the Sanitary District of Chicago, June 5.

"Transportation by Post," by T. R. Sharp, chief inspector of the Post Office Department, June 6.

"Methods of Reducing the Demand for Transportation," by Walter Mills, specialist in factory locations; John C. Kennedy, chairman of the City Club committee on neighborhood centers, and Thomas Allison, head resident of Henry Booth House, June 7.

Byllesby & Company Not to Reorganize Toledo Railways & Light Company

H. M. Byllesby & Company, Chicago, Ill., who have been examining the property of the Toledo Railways & Light Company, Toledo, Ohio, have decided, owing to the unsettled condition of affairs, especially the political situation in Ohio and elsewhere, not to undertake a reorganization for the security holders at this time. W. W. Miller, of Hornblower, Miller & Potter, counsel for the bondholders' committee, has issued the following statement:

"It is understood that while the examination by H. M. Byllesby & Company of the properties of the Toledo Railways & Light Company and the operations thereof has fully demonstrated the value of the properties and their earning powers as represented to them, nevertheless Byllesby & Company, owing, as stated by them, to the general unsettled condition of the political atmosphere, especially in Ohio, do not care at the present time to assume the responsibility of undertaking the reorganization, the completion of which might take them into a presidential election. There has been no meeting of the bondholders' committee to determine whether to delay further the reorganization, but the general feeling of the members of the reorganization committee is that the security holders themselves will proceed with the reorganization without delay."

The Toledo Railways & Light Company has received a franchise to lay double tracks on Monroe Street between Nineteenth Street and Lawrence Avenue. The improvement is to be made immediately at a cost of about $90,000. This franchise differs from the one prepared by City Solicitor Schreiber some time ago. It states that the city claims that all the franchise rights of the company on Monroe Street have expired, while the company claims to be operating on the street lawfully. Any rights which it may be proved that the company has are not to be affected by the enactment of the new ordinance. F. R. Coates, president

of the company, had stated that the company could not accept a franchise which would require it to acknowledge that some other franchise had expired. The new franchise has been accepted.

On May 18, 1912, it was announced that attorneys for the United States Mortgage & Trust Company and for the Toledo Railways & Light Company had agreed to extend until July 1, 1912, the time for filing in the federal court an answer to the petition for a receiver.

Trial Trip for Newspaper Men Over the New York, Westchester & Boston Railway

Under the personal direction of L. S. Miller, president of the New York, Westchester & Boston Railway, a two-car train carrying between 75 and 100 representatives of the daily and weekly press was operated over the company's line on May 20, 1912. The visitors were taken from the terminal at 180th Street and Bronx Park, New York, N. Y., to the North Avenue station of the New Rochelle branch. The train was then operated to the junction at Mount Vernon and hauled by a steam locomotive over the White Plains branch from Mount Vernon to Wykagyl. Luncheon was served at Wykagyl by the company through the courtesy of the Wykagyl Club. At the close of the luncheon one of the newspaper representatives thanked the company on behalf of all the papers for the splendid work which it is doing to develop Bronx Borough and Westchester County. Mr. Miller acknowledged the cordial interest which the press has shown in the company's work and said that he hoped the New York, Westchester & Boston Railway would continue to enjoy this co-operation. Mr. Miller announced that the road would be open for traffic from Bronx Park to New Rochelle on Wednesday, May 29, and early in July to the Harlem River.

The members of the Public Service Commission of the First District of New York and the engineers of the commission have inspected the New York, Westchester & Boston Railway between New York City and New Rochelle.

Earnings in Cleveland in April

The statement of the Cleveland (Ohio) Railway for April, 1912, shows a book surplus of about $26,000, but an actual deficit of between $18,000 and $20,000 in the operating expenses. An extraordinary amount of track laying and repairs in April will also make a deficit in the maintenance fund.

The board which was chosen to arbitrate the dispute between the men and the company over the Superior Avenue schedule did not meet on May 15, the date set for that purpose, as F. H. Goff and Warren Bicknell, of the board, were out of the city. The men claim that they are not getting proper layovers under the schedules prepared by Street Railway Commissioner Witt, but that the introduction of an extra car by J. J. Stanley, president of the Cleveland Railway, has improved conditions materially.

Track layers and laborers employed by the Cleveland Railway on Madison Avenue, N. W., went on strike on May 18, 1912, because the company did not make the minimum wage $2 per day. The men had been receiving $1.70 and $1.80 per day. Mr. Stanley ordered the work stopped.

Arbitration of Differences in Pittsburgh.—The differences between the Pittsburgh (Pa.) Railways and its employees in regard to terms of service will be arbitrated. The board of arbitration will be composed of three members, consisting of Clarence Burleigh for the company, Councilman J. P. McArdle for the men and a third member to be chosen by these two.

Changes in the Personnel of the Pennsylvania Railroad.—The Pennsylvania Railroad has discontinued the practice of designating the vice-presidents numerically. The directors on May 8, 1912, elected Samuel Rea vice-president, W. W. Atterbury vice-president in charge of operation, George D. Dixon vice-president in charge of traffic, Henry Tatnall vice-president in charge of finance, W. Heyward Myers vice-president in charge of real estate, purchases and insurance.

Exhibits at the M. C. B. and M. M. Conventions.—The Railway Supply Manufacturers' Association, through J. D. Conway, secretary, 2135 Oliver Building, Pittsburgh, Pa., has issued circular No. 2, which gives in detail the arrangements which have been made for the exhibit of railway apparatus to be held in connection with the conventions of the Master Car Builders' Association and the Master Mechanics' Association at Atlantic City, N. J., June 12 to 19, 1912.

Electrification of Melbourne Railways.—The agent general for Victoria, Melbourne Place, Strand, W. C., London, Eng., will receive tenders until June 4, 1912, for the electrification of the Melbourne Suburban Railways. The work is divided into the following sections: (1) Alternative direct-current system: (a) turbo-alternators and transformers; (b) substation equipment; (c) electrical equipment of coaches. (2) Single-phase alternating current system: (a) turbo-alternators and transformers; (b) substation equipment; (c) electrical equipment of coaches. (3) Common to both alternatives: (a) boilers and boiler house equipment; (b) condensing plant.

Reply of Mayor of Detroit to Complaint.—In reply to a letter from a citizen in one of the suburban villages near Detroit who complained about having to pay a fare of 10 cents to Detroit, Mayor Thompson of Detroit expressed his opinion in regard to the defeat of the ordinance which he and others formulated for the settlement of the street railway question in Detroit. His reply, dated May 6, 1912, was published in the daily papers. The Mayor reviewed the entire situation and stated that, as the people had seen fit to defeat the ordinance at a regular election, they must now be content with the best terms that can be secured until another agreement can be reached.

Exemption from Pole Stenciling Order Refused.—The Public Service Commission of the Second District of New York has denied the application of the International Railway, Buffalo, N. Y., to be exempted from the order of the commission requiring railroad and other corporations to stencil and number their poles for carrying overhead wires. The application was made solely on the ground of saving expense. The commission finds that the cost of stenciling the poles is not prohibitive, it being shown at the hearing that the stenciling could be done for about 3 cents per pole. The order requiring the stenciling of poles was made so that a reference to a pole or to its condition by an inspector of the commission would be understood by the company owning the pole; also so that wherever faulty or unsafe construction exists the responsibility could be promptly placed.

Ordinance Approved to Employ Experts in Transit Study in Philadelphia.—The Councils of Philadelphia, Pa., have passed the bill to appropriate $50,000 to the department of public works to defray the expenses of an investigation of the city's transportation problems. Before final action was taken, however, Common Council met as a committee of the whole and reversed its previous action providing that in the expenditure of the appropriation "all engineers and experts employed by authority of this ordinance shall be residents of Philadelphia." The Mayor immediately approved the measure. He said that it had been decided that the committee should confine itself to a few of the larger problems of civic improvements rather than dissipate its energies over a wide field of endeavor. Continuing, he said: "The principal problem to be considered at this time will be improved transit facilities. That problem is, I believe, the most important before the people at this time."

Expert Study of Public Utility Problems Abroad.—R. H. Whitten, librarian-statistician of the Public Service Commission for the First District of New York, has been secured by the executive council of the department on regulation of interstate and municipal utilities of the National Civic Federation for approximately four months' special investigation work into the matter of public service corporations in England, and he has sailed from Boston for Liverpool. In his investigation Mr. Whitten will give particular attention to the questions of profit sharing, the sliding-scale fare and control of capitalization. The contemplated investigation in England is a part of the general scheme of the investigation that is being made by this de-

partment of the Civic Federation into the question of what constitutes adequate regulation of public utilities. The executive council of the federation has announced that a part of its compilation of the public service laws of the United States, England and Canada, will be ready soon.

Bids for Cars for San Francisco's Municipal Railroad.—Bids for constructing and delivering forty-three cars for the Geary Street, Park & Ocean Municipal Railroad, San Francisco, Cal., were opened on May 8, 1912, by the board of public works of San Francisco. The W. L. Holman Company, San Francisco, and Pierson, Roeding & Company, representing The J. G. Brill Company, Philadelphia, Pa., were the only bidders. The Holman Company offered to furnish semi-steel cars for $7,700 each and wooden cars for $7,500 each, with a charge of $1,500 each for additional trucks. Pierson, Roeding & Company bid $7,780 each for semi-steel cars and $1,600 each for trucks, but did not bid on wooden cars. Bids for all steel cars had also been invited, but none was filed. The equipment was described generally as of the California type arranged for prepayment operation. The Jewett Car Company, Newark, Ohio, and the McGuire-Cummings Company, Chicago, Ill., which quoted prices when the original bids were asked in November, 1911, did not submit bids this time.

Favorable Decision in New York Subway Case.—The Appellate Division of the Supreme Court, Second Department (Kings County), has sustained the decision of Justice Blackmar of the Supreme Court in the case of the Admiral Realty Company and others against the city of New York and the Public Service Commission, upholding the constitutionality of certain features of the proposed operating contracts with the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company for the dual system of subways. These cases originated in applications for injunctions to prevent the adoption of the proposed operating contracts on the ground that they would be a violation of the constitutional prohibition against the lending of the city's credit to a private corporation. Justice Blackmar in the Supreme Court, after hearing the arguments, decided that the proposed contracts do not involve the lending of the city's credit to a private corporation within the meaning of the constitution. It is probable that the case will be appealed to the Court of Appeals, from which the city authorities hope to get a decision before the adjournment of that court for the summer vacation.

Plans Progressing for Electrification of Bridgetown Tramways.—Plans are progressing for the electrification of the tramway system of the Bridgetown Tramways Company, Ltd., Bridgetown, Barbados, B. W. I., which is controlled by the McKinley interests. Bridgetown is the capital of the island and has a population of about 35,000 people. The installation of the electrical equipment at Bridgetown will be in charge of W. R. Morrison, Peoria, Ill., as general manager and James McKenzie Meade, Peoria, Ill., as electrician and chief engineer, both of whom will go to the island as soon as the equipment for the line has been bought. The company proposes to purchase twenty open cars with a capacity of twenty-eight passengers each and has arranged for operation with the double trolley system. A power station will be installed, new carhouses and shops will be built and about 10 miles of new 60-lb. T-rail will be laid to a gage of 3 ft. 3 in. The equipment of the power station will include two 175-kw d.c. generators, operating at 600 volts. Either Diesel oil engines or the Locomobile type of superheated engine will be used. The construction office for the electrification of the system is at the Mayer Building, Peoria, Ill. The officers of the Bridgetown Tramways Company, Ltd., are as follows: J. C. Fox, Portland, Me., president; G. F. Duncan, Portland, Me., vice-president; Edward Woodman, Portland, Me., secretary; John Dowrich, Bridgetown, assistant secretary; A. H. McKinstry, Bridgetown, auditor; W. R. Morrison, Peoria, Ill., general manager; James McKenzie Meade, Peoria, Ill., electrician and chief engineer. The local manager at Bridgetown is W. H. Kirton. The directors of the company include T. B. Macaulay, Montreal; W. B. McKinley, Champaign, Ill., and George F. Duncan, Portland, Me. Mr. Morrison was formerly general superintendent of the Wichita Light & Railroad Company, Wichita, Kan.

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Accountants' Association

In a circular dated May 14, 1912, issued in regard to the semi-annual meeting of the Central Electric Railway Accountants' Association to be held at Cedar Point, Ohio, on June 12, 13 and 14, C. M. Witt, secretary of the association, said in part:

"From the interest displayed in the last six months it is evident that many members are prepared for the discussion. No time limit will be placed on any one who desires to impart any information. The program is being arranged so that it will not conflict with the papers of the Central Electric Railway Association, in which the accountants are interested. Some of the foremost accountants in this country are to contribute papers of vital interest at this meeting, and we cannot afford to miss hearing them."

Central Electric Railway Association

The following program has been arranged for the business sessions of the meeting of the Central Electric Railway Association which is to be held at The Breakers, Cedar Point, Ohio, on June 12, 13 and 14, 1912:

JUNE 12, 7:30 P.M.

Meeting of executive committee.

JUNE 13, 9 A.M.

Business session and reports of committees.

Paper, "Split-Frame Motors Versus Box-Frame Railway Motors," by M. B. Lambert, of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

Discussion.

Paper, "Interurban Traffic Analysis with Its Relation to Time Table," by A. J. Boardman, superintendent of the Brazil and Danville division of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Discussion.

Paper, "Sale of Current to Small Municipalities and Industries Along Interurban Lines," by W. B. Milligan, electrical engineer of the Western Ohio Railroad, Lima, Ohio.

Discussion.

Paper, "Transmission Lines Versus Foreign Low Potential Lines," by J. G. Swain, superintendent of motive power of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.

Discussion.

JUNE 14, 9 A.M.

Business session and reports of committees.

Paper, "Standardization," by R. N. Hemming, superintendent of motive power of the Indiana Union Traction Company, Anderson, Ind.

Discussion.

Paper, "Talking to the People," by A. D. B. VanZandt, publicity agent of the Detroit (Mich.) United Railway.

Discussion.

PROGRAM OF ENTERTAINMENT

The following program of entertainment has been arranged under the auspices of the hotel and arrangement committee:

JUNE 12, 9 P.M.

Informal reception and ball at Coliseum.

JUNE 13

Trip for the ladies to Johnson's Island, famous during the Civil War as a Union prison for Confederate officers. This will afford an opportunity to visit the last resting place of the Confederate dead, the Mammoth Quarries, etc.

Water baseball game in front of The Breakers at 4 p.m.

Fish dinner (informal) at 7:30 p.m., in banquet room, for members and ladies attending and registering at convention.

JUNE 14

Exploration expedition for the ladies at 10 a.m. through the lagoons.

Steamer ride at 1 p.m. on bay and lake for members and the ladies accompanying them.

Space for exhibits can be secured by writing James A. Ryan, care Cedar Point Resort Company, Sandusky, Ohio; S. D. Hutchins, Columbus, Ohio, or L. G. Parker, Cleveland, Ohio.

Financial and Corporate

Stock and Money Markets

May 22, 1912.

Prices of securities traded in on the New York Stock Exchange were irregular and unsettled to-day. In some of the most active issues wide changes in price occurred first in one direction and then in the other. Final quotations for the leading issues showed more declines than advances. The feature in tractions lately has been B. R. T. Rates in the money market to-day were: Call, 2½@3 per cent; 60 days, 3@3¼ per cent; 90 days, 3¼@3½ per cent.

In the Philadelphia market prices displayed a downward tendency. The exceptions were the local tractions, Philadelphia Electric and United Gas Improvement.

In the Chicago market the tendency was also toward lower prices. Chicago Railways Series 2's declined more than a point. Bonds were in fair demand, Chicago Railways 5's leading in total of sales.

In the Boston market prices were weak. Small sales were recorded of Boston Elevated Railway and West End Street Railway and Massachusetts Electric issues.

In the Baltimore market the stock of the United Railways continued in demand. Important sales were reported of the United Railways 4's, United Railways incomes and United Railways notes.

Quotations of traction and manufacturing securities as compared with last week follow:

	May 15.	May 22.
American Brake Shoe & Foundry (common)	a96¼	a93¾
American Brake Shoe & Foundry (preferred)	a137	136½
American Cities Company (common)	...	....
American Cities Company (preferred)	...	....
American Light & Traction Company (common)	a302	a308
American Light & Traction Company (preferred)	a110	a110
American Railways Company	a44	a43⅞
Aurora, Elgin & Chicago Railroad (common)	a46½	44½
Aurora, Elgin & Chicago Railroad (preferred)	86	85½
Boston Elevated Railway	128	*128
Boston Suburban Electric Companies (common)	a15	a15
Boston Suburban Electric Companies (preferred)	a81¼	78
Boston & Worcester Electric Companies (common)	a10½	a10½
Boston & Worcester Electric Companies (preferred)	a54	a54
Brooklyn Rapid Transit Company	85¾	88⅛
Capital Traction Company, Washington	a128¼	a128
Chicago City Railway	a190	a190
Chicago Elevated Railways (common)	a40	a40
Chicago Elevated Railways (preferred)	a93	a93
Chicago Railways, ptcptg., ctf. 1	a98	a96
Chicago Railways, ptcptg., ctf. 2	a32	a31
Chicago Railways, ptcptg., ctf. 3	a10	a10
Chicago Railways, ptcptg., ctf. 4	a5	a5
Cincinnati Street Railway	a130	a130
Cleveland Railway	a106	a106
Cleveland, Southwestern & Columbus Ry. (common)	*5	*5
Cleveland, Southwestern & Columbus Ry. (preferred)	*32	*32
Columbus Railway & Light Company	a55	a55
Columbus Railway (common)	80	80
Columbus Railway (preferred)	a93½	a95
Dayton Street Railway (common)	a25	a25
Dayton Street Railway (preferred)	a100	a100
Denver & Northwestern Railway	*135	*135
Detroit United Railway	a75	a75
General Electric Company	170⅛	169⅞
Georgia Railway & Electric Company (common)	a127	a125
Georgia Railway & Electric Company (preferred)	a85½	a85¾
Interborough Metropolitan Company (common)	20¼	20¾
Interborough Metropolitan Company (preferred)	59¼	59⅜
International Traction Co. 4% bonds, rcts	*75	*75
Indiana Union Traction Company	...	*7
Kansas City Railway & Light Company (common)	a21	a21
Kansas City Railway & Light Company (preferred)	a48½	a46
Lake Shore Electric Railway (common)	7	*7
Lake Shore Electric Railway (1st preferred)	91½	*91½
Lake Shore Electric Railway (2d preferred)	27	*27
Manhattan Railway	a137	a138
Massachusetts Electric Companies (common)	a20	a20
Massachusetts Electric Companies (preferred)	a95½	a95½
Milwaukee Electric Railway & Light (preferred)	*104½	*104½
Norfolk Railway & Light Company	*27	*27
North American Company	a83	82
Northern Ohio Light & Traction Company (common)	a70	a70
Northern Ohio Light & Traction Company (preferred)	a103½	a105
Philadelphia Company, Pittsburgh (preferred)	a52⅞	52½
Philadelphia Company, Pittsburgh (common)	a44	43¾
Philadelphia Rapid Transit Company	a23	22¾
Portland Railway, Light & Power Company	*68½	*68½
Public Service Corporation	a112	a112
Third Avenue Railway, New York	40½	39½
Toledo Railways & Light Company	a10	a10
Twin City Rapid Transit Co., Minneapolis (common)	a106	a105⅞
United Rys. & Electric Company (Baltimore)	*22¼	a24½
United Rys. Inv. Co. (common)	32¾	a33½
United Rys. Inv. Co. (preferred)	a61¾	61½
Virginia Railway & Power Company (common)	a49⅞	a47⅝
Virginia Railway & Power Company (preferred)	88	88
Washington Ry. & Electric Company (common)	a90	a90
Washington Ry. & Electric Company (preferred)	a96½	a94¾
West End Street Railway, Boston (common)	a85	a85¼
West End Street Railway, Boston (preferred)	a101½	a101½
Westinghouse Elec. & Mfg. Co.	a76	a71
Westinghouse Elec. & Mfg. Co. (1st preferred)	a121	a120

*Last sale. a Asked.

ANNUAL REPORT

Westinghouse Electric & Manufacturing Company

Earnings of the Westinghouse Electric & Manufacturing Company for the year ended March 31, 1912, with a comparison with two previous years, were as follows:

Year Ended March 31.	1910.	1911.	1912.
Gross earnings—sales billed	$29,248,682	$38,119,312	$34,196,446
Cost of sales, including all selling, administration and general expenses	25,695,704	32,510,547	30,604,850
Net manufacturing profits	$3,552,978	$5,608,765	$3,591,596
Other income	1,616,561	1,515,531	1,160,442
Gross income	$5,169,539	$7,124,296	$4,752,038
Less—Inventory adjustments, inactive apparatus and material scrapped, bad accounts and extraordinary items of expense charged to income	419,692	657,704	708,917
Net income applicable to interest and other charges	$4,749,847	$6,466,592	$4,043,121
Interest charges	1,689,183	1,585,487	1,599,028
Net income—surplus for the year.	$3,060,664	$4,881,105	$2,444,093

Guy E. Tripp, chairman of the board of directors, says in his statement to the stockholders:

"The sales billed for the year were $3,922,866 less than the sales billed for the previous year. This decrease is due partly to an actual reduction of output, but to a greater extent to the lower prices obtained. The latter is reflected in the decreased percentage of net manufacturing profit on sales billed.

"The value of unfilled orders as of March 31, 1911, was $7,616,058; as of March 31, 1912, the value of unfilled orders was $8,137,961. During the month of April the value of orders booked exceeded that of any month during the year ended March 31, 1912, so that the value of unfilled orders as of April 30, 1912, was $9,218,302.68.

"In the report for the year ended March 31, 1911, reference was made to a suit filed by the United States against your company and others with respect to the incandescent lamp business. This suit was terminated during the past year by the entry of a decree, which, as predicted in the report of your directors for the year ended March 31, 1911, does not seriously affect the conduct of your lamp business.

"The surplus as of March 31, 1911, was $5,064,224. This was decreased during the year by various items detailed in the statement of profit and loss to $5,887,182. This balance was increased by the net income for the year, $2,444,093, to a gross surplus of $8,331,276. Against this surplus have been charged dividends on the preferred stock at the rate of 7 per cent per annum and a dividend of 1 per cent on the common stock, declared by your directors on March 27, 1912. These charges reduced the surplus to $7,609,240, against which depreciations of investments were written off as follows: Stock, Westinghouse Electric Company, Ltd., $250,000; debentures, Société Électrique Westinghouse de Russie, $243,243; bonds, Lackawanna & Wyoming Valley Rapid Transit Company, $557,042; total depreciations, $1,050,285. As a result of these depreciations, the surplus as of March 31, 1912, shown in the balance sheet, is $6,648,964.

"The increase of $1,503,042 in property and plant, which now stands at $19,195,188, as compared with March 31, 1911, is due chiefly to the completion of the extensions of the buildings on the additional ground purchased for the Newark plant that were in progress at the close of last year; the purchase of a new plant at Pittsburgh by the R. D. Nuttall Company, which heretofore occupied leased premises not well adapted to its manufacturing requirements; the erection of a new four-story and basement brick building in place of a one-story frame building and other general improvements at the East Pittsburgh Works.

"The purchases at Newark and by the Nuttall company at Pittsburgh include considerable real estate not yet occupied by buildings which can be used later to increase your manufacturing facilities still further. The buildings already erected have resulted in a considerable increase in the capacity and efficiency of each of these plants.

"An extension was obtained of the lease of the property on which your company operates an iron foundry at Pittsburgh, Pa. The plans mentioned in last year's report for the

erection of foundry and pattern buildings at Trafford City have not yet been carried out. It is possible that the erection of these buildings will be started during the current year.

"The item of sinking fund, $444, represents the uninvested balance of the sinking fund payments made to the trustee on account of the company's issue of convertible sinking fund 5 per cent. gold bonds. As a result of sinking fund payments made during the year, there were retired a total of $537,000 face value of convertible bonds and $260,000 face value of debenture certificates.

"The aggregate book value of investments as of March 31, 1912, $23,384,515, shows a decrease of $650,120, as compared with the book value as of March 31, 1911. The amount of decrease due to depreciations has been detailed in the analysis of the profit and loss account. The only important cash investments made during the past year are: Bonds of Westinghouse Electric & Manufacturing Company, $143,041; debentures of Societa Italiana Westinghouse, $481,335. The former have been purchased in anticipation of sinking fund requirements due Dec. 31, 1912. The debentures of the Italian company were received in payment for cash advances made partly during the year ended March 31, 1911.

"Other changes in investments represent bonds and stocks taken principally in part payment for apparatus sold. The aggregate amount so taken is less than the amount realized from the sale of other investments.

"There have been no unusual developments during the past year in connection with the affairs of the several foreign Westinghouse companies in which your company has investments. The British, French and Canadian Westinghouse companies, in which your company has the largest investments, all improved in net profit during the year ended Dec. 31, 1911, as compared with the previous year. The Russian company also showed some improvement. The Italian company has suffered because of the war between Italy and Turkey, in that the Italian government has delayed the further electrification of the state railways and no orders for electric locomotives were received by the Italian company during the year which was ended on Dec. 31, 1911.

"The several items comprising the total of current assets, $19,848,706, have been verified by the official auditors of your company. During the year a reserve was created monthly against which all losses on notes and accounts receivable were charged.

"It is the practice of your company, in conjunction with its official auditors, to verify by inventory all of the accounts classified under 'working and trading assets.' which amounted to $13,119,286. The inventory reports of materials and apparatus on hand were valued, as to raw materials, at purchase prices or less, and as to completed parts and apparatus, at factory cost or less.

"The total of other assets, $7,072,513, shows a decrease compared with the total as of March 31, 1911. The charges to patent account during the year aggregated less than $25,000. All other expenditures for patents, licenses, development and experimental work were charged to expenses and are included in the cost of sales."

The list of investments shown in the report includes the following in traction companies:

	Book Values Mar. 31, 1911.	Book Values Mar. 31, 1912.	Inc.
Lackawanna & Wyoming Valley Rapid Transit Co., bonds and stock...	$4,147,043	$3,590,001	*†$557,042
Grand Rapids, Grand Haven & Muskegon Railway Co., bonds.....	500,000	500,000	
Indianapolis & Cincinnati Traction Co., bonds.....	139,400	139,400	
Rock Island Southern Ry. Co., bonds	52,100	113,030	60,930
Spokane & Inland Empire Ry. Co., stock	85,000	85,000	
Miscellaneous traction companies, bonds and stock.....	4,715	4,615	†100
Totals.....	$4,928,258	$4,432,046	

*Depreciation. †Decrease.

The list of investments also includes a number of power companies, among them the Niagara, Lockport & Ontario Power Company and the Georgia Railway & Power Company. The total book value of the stocks, bonds and notes of all the power companies as of March 31, 1911, was $2,430,719, compared with $2,136,438 as the book value of these securities as of March 31, 1912.

New York State Railways to Merge Lines

The application of the New York State Railways to merge into it the Syracuse Rapid Transit Railway, the Oneida Railway, the Utica & Mohawk Valley Railway and the Rochester & Suburban Railway, and to execute a first consolidated and refunding mortgage for $50,000,000 was before the Public Service Commission, Second District, on May 14, 1912. The companies which it is sought to merge are now controlled by the New York State Railways. Two years ago the commission authorized this company to execute a mortgage for $35,000,000 to secure an issue of fifty-year 5 per cent gold bonds. It is now proposed to substitute a $50,000,000 mortgage providing for 4½ per cent bonds. Horace E. Andrews, president, and Walter N. Kernan, vice-president and general counsel, appeared for the company and stated that the proposed new mortgage would, in addition to providing a lower rate of interest, enable the company to take up the underlying bonds of the companies it is proposed to merge; this is not possible under the existing mortgage. They also pointed out that the issuance of the new mortgage and merger of the corporations mentioned would result in financial and operating economies and, because of the mortgage covering the entire property, secure a much better market for the bonds. At the present time it is proposed to issue bonds under the new mortgage to the amount of $6,337,038. Of this amount $4,500,000 is to refund outstanding bonds, $1,715,138 is to purchase outstanding stock of the Syracuse Rapid Transit Railway, and $121,900 is to reimburse petitioner for moneys expended for purchase of preferred stock of the Syracuse Rapid Transit Railway. The $4,500,000 of bonds now outstanding are held by the Rochester Railway & Light Company, a subsidiary of the New York State Railways. The company was required to furnish statements of the outstanding capitalization of the companies it is sought to merge and the time when their bonds are to be retired; also a statement of the dividends paid on the stock of the Syracuse Transit Railway.

Organization of United Gas & Electric Corporation, Controlling International Traction of Buffalo

The United Gas & Electric Corporation of Connecticut, which was incorporated in Connecticut on March 8, 1912, by the Bertron, Griscom & Jenks interests, has acquired ownership of the United Gas & Electric Company of New Jersey and it is stated will absorb by merger the Susquehanna Railway & Light Company. In addition the company has secured control of the International Traction Company, Buffalo, N. Y.; the Consumers' Electric Light & Power Company, New Orleans; Houston (Tex.) Gas & Fuel Company, and Harrisburg Electric Service Company.

After consolidation with the Susquehanna Railway & Light Company, the new company will be capitalized as follows: $25,000,000 of authorized 6 per cent cumulative preferred stock, $20,000,000 of authorized common stock and $7,500,000 of three-year convertible 5 per cent secured notes. The preferred stock is to bear 6 per cent cumulative dividends until April, 1915, after which the dividends are to be at the rate of 7 per cent. Of the authorized $25,000,000 of preferred stock, $9,463,100 is outstanding, $1,172,170 having been issued for equal exchange for preferred stock of the United Gas & Electric Company of New Jersey, $7,500,000 being reserved for convertible notes and $6,864,730 being in the treasury. Of the common stock, $8,380,000 has been issued and $11,620,000 is in the treasury. Of the $7,500,000 of three-year convertible 5 per cent secured notes, $3,300,000 have already been issued, $2,200,000 are to be issued to purchase bonds of the United Gas & Electric Company of New Jersey and for working capital, and $2,000,000 are to be retained in the treasury. The notes are to be convertible after April 1, 1914, into preferred stock of the company par for par.

The management of the new companies will be in the hands of the same organization which has operated the Susquehanna Railway, Light & Power Company, while the International Railway, Buffalo, will be under the direct supervision of T. E. Mitten, formerly president of the Chicago City Railway and now chairman of the executive committee of the Philadelphia Rapid Transit Company.

Following is a list of the securities that will be owned by the United Gas & Electric Corporation directly or through ownership of the United Gas & Electric Company of New Jersey and the Tractional Company, when the merger is completed:

		Owned.	Issued.
Harrisburg (Pa.) Electric Service Co.	Pfd.	$350,000	$1,000,000
	Com.	1,000,000	1,000,000
Houston (Tex.) Gas & Fuel Co.	Pfd.	100,000	100,000
	Com.	1,500,000	1,500,000
Consumers' Electric Lgiht & Power Co., New Orleans, La.	Pfd.	.....	500,000
	Com.	1,000,000	1,000,000
International Traction Co., Buffalo, N. Y.	Pfd.	.....	5,000,000
	Com.	5,000,000	10,000,000
Altoona (Pa.) Gas Light & Fuel Co.	Pfd.	100,000	100,000
	Com.	300,000	305,000
Colorado Springs (Col.) Light, Heat & Power Co.	Pfd.	700,000	1,000,000
	Com.	986,400	1,000,000
Elmira (N. Y.) Water, Light & Railroad Co.	Pfd.	314,800	683,000
	Com.	856,400	1,000,000
Richmond (Ind.) Light, Heat & Power Co.	Com.	300,000	300,000
Leavenworth (Kan.) Light, Heat & Power Co.	Com.	600,000	600,000
Union Gas & Electric Co., Bloomington, Ill.	Pfd.	150,000	150,000
	Com.	750,000	750,000
Lockport (N. Y.) Light, Heat & Power Co.	Com.	150,000	150,000
Citizens' Gas & Fuel Co., Terre Haute, Ind.	Com.	298,000	300,000
Hartford (Conn.) City Gas Light Co.	Pfd.	14,450	750,000
	Com.	892,000	1,250,000
Wilkes-Barre (Pa.) Co.	Com.	1,072,750	1,500,000
Lancaster (Pa.) City Railway & Light Co.	Pfd.	.....	1,000,000
	Com.	1,200,000	1,200,000

The Lancaster County Railway & Light Company owns the following companies:

		Owned.	Issued.
Conestoga Traction Co., Lancaster, Pa.	Pfd.	$799,000	$800,000
	Com.	3,199,000	3,200,000
Lancaster (Pa.) Gas Light & Fuel Co.	Com.	550,000	550,000
Edison Electric Co., Lancaster, Pa.	Com.	1,500,000	1,500,000
Conestoga Realty Co., Lancaster, Pa.	Com.	100,000	

Columbus Railway & Light Company, Columbus, Ohio.—C. M. Clark, of E. W. Clark & Company, Philadelphia, Pa., spent several days in Columbus, Ohio, recently in conference with S. G. McMeen, president of the Columbus Railway & Light Company, and it is expected that plans for the reorganization of the company and its subsidiaries will be presented to the directors, who are to meet within a few days. It is said that under the proposed plan the Columbus Railway & Light Company and its subsidiaries will be merged as one company.

Georgia Railway & Power Company, Atlanta, Ga.—Ashley & Company, New York, N. Y., and Boston, Mass., are offering at 95 and interest first mortgage 5 per cent bonds of the Blue Ridge Electric Company, an underlying company of the Georgia Railway & Power Company, which agrees to retire the bonds on or before Oct. 1, 1916, at par and interest and in the meantime to meet the interest payments thereon.

Hudson Companies, New York, N. Y.—C. W. Taintor, Boston, Mass., has been elected a director of the Hudson Companies to succeed Arthur Westervelt, resigned.

Illinois Traction System, Champaign, Ill.—The St. Louis, Springfield & Peoria Railroad, which is controlled by the Illinois Traction System, has filed for record at Peoria, Ill., a mortgage for $15,000,000 given in favor of the Illinois Trust & Savings Bank, Chicago, Ill., as trustee.

Indianapolis, Crawfordsville & Danville Traction Company, Crawfordsville, Ind.—The Indianapolis, Crawfordsville & Danville Traction Company, the successor to the Indianapolis, Crawfordsville & Western Traction Company, has increased its capital from $600,000 to $800,000 to provide funds to extend the line through Danville.

Indianapolis, New Castle & Northeastern Traction Company, Indianapolis, Ind.—The Indianapolis, New Castle & Northeastern Traction Company, the incorporation of which was noted in the Electric Railway Journal on March 23, 1912, has taken over from D. M. Parry, Indianapolis, Ind., and William E. Stevenson, Indianapolis, Ind., representing the bondholders, the Indianapolis, New Castle & Toledo Electric Railway, the property of which was sold under foreclosure some time ago.

Lehigh Valley Transit Company, Allentown, Pa.—Charles H. Bean & Company, Philadelphia, Pa., have purchased for interests friendly to the Lehigh Valley Transit Company half of the holdings of the late William F. Harrity in the common and preferred stocks of the company.

Los Angeles (Cal.) Railway Corporation.—The Continental & Commercial Trust & Savings Bank, Chicago, Ill., is offering for subscription at a price to yield more than 5 per cent $500,000 of first and refunding mortgage sinking fund 5 per cent gold bonds of the Los Angeles Railway Corporation. The bonds are part of the authorized issue of $20,000,000 of bonds dated Dec. 1, 1910, and due Dec. 1, 1940.

Monongahela Traction Company, Fairmont, W. Va.—The stockholders of the Fairmont & Clarksburg Traction Company, Fairmont & Northern Traction Company and Clarksburg & Western Electric Railway have ratified the proposed merger of these companies as the Monongahela Traction Company. The organization of the Monongahela Traction Company was referred to in the Electric Railway Journal of March 23, 1912, page 479.

Northern Texas Electric Company, Fort Worth, Tex.—Stone & Webster, Boston, Mass., are offering for subscription at a price to yield about 6.20 per cent $500,000 of a new issue of 6 per cent stock of the Northern Texas Electric Company, which owns the capital stock of the Northern Texas Traction Company, which operates in Fort Worth and between Fort Worth and Dallas. The proceeds from the sale of the new issue of preferred stock are to be used to provide funds for double-tracking a portion of the interurban railway near Fort Worth, to purchase additional rolling stock, to increase the capacity of the power station by the installation of an additional 5000-kw turbine and to provide for other extensions and improvements.

Portland Railway, Light & Power Company, Portland, Ore.—On May 1, 1912, the Portland Railway, Light & Power Company disposed of the Salem Street Railway to the Welch interests, which control the Portland, Eugene & Eastern Railway. The Portland Railway, Light & Power Company, however, retains the electric and gas light plant in Salem. The company disposed of the Salem Street Railway principally on account of the fact that it had no railroad connection with Salem.

St. Albans & Swanton Traction Company, St. Albans, Vt.—The St. Albans & Swanton Traction Company was incorporated on May 10, 1912, in Vermont to succeed the St. Albans Street Railway, the property of which was sold under foreclosure on April 27, 1912, to Walter R. Dame, Canton, Mass., as noted in the Electric Railway Journal of May 4, 1912, page 771. The St. Albans & Swanton Traction Company has organized as follows: John W. Ogden, Malden, Mass., president; Fuller C. Smith, St. Albans, vice-president; H. Charles Royce, St. Albans, secretary; Walter R. Dame, Clinton, Mass., treasurer; Frank C. Wilkinson, St. Albans, superintendent. The authorized capital stock of the company is $200,000, of which $125,000 has been issued. Power to operate the road is purchased from the Vermont Power & Manufacturing Company. The company owns a power plant, but it is not now in operation.

Seattle, Renton & Southern Railway, Seattle, Wash.—The Seattle, Renton & Southern Railway was placed in the hands of E. M. Mills, president of the company, and O. D. Colvin as receivers on March 14, 1912, by Judge C. H. Hanford, of the District Court of the United States for the Western District of Washington, on complaint made by members of the firm of Peabody, Houghtelling & Company, Chicago, Ill. This is the second time that the company has been in court on receivership complaint. A temporary receiver was appointed recently at the request of W. R. Crawford, formerly president of the company, but Judge A. W. Frater denied Mr. Crawford's petition for a permanent receiver. In the complaint filed on May 14 it was alleged that the appointment of the temporary receiver by the Superior Court injured the credit of the company and that default was made in the payment of interest to the amount of $30,000 due on May 1, 1912.

Third Avenue Railway, New York, N. Y.—The Third Avenue Railway has petitioned the Public Service Commission of the First District of New York for permission to merge the Union Railway, a subsidiary of the Third Avenue Railway, with the New York City Interborough Railway. The merger is to be effected by the Third Avenue Railway purchasing $4,122,500 of the $5,000,000 of stock of the New York City Interborough Railway. In its petition the Third Avenue Railway likewise asks permission to acquire 693 shares of Dry Dock, East Broadway & Battery Railroad; 8002 shares of the Forty-second Street, Manhattanville & St. Nicholas Avenue Railway; 6000 shares of New York,

Westchester & Connecticut Traction Company, and 200 shares of Third Avenue Bridge Company stock. These stocks were originally purchased by the reorganization committee of the Third Avenue Railroad, and are now to be turned over to the Third Avenue Railway. To finance these stock acquisitions the Third Avenue Railway asks the commission's permission to sell at not less than 80 per cent of their par value as many of its fifty-year 4 per cent bonds as may be necessary to purchase $1,413,000 par value of New York City Interborough Railway bonds and such shares of its stock as the petitioner may purchase, and twenty shares of the Dry Dock, East Broadway & Battery Railroad outstanding and such of the outstanding 287 shares of Forty-second Street, Manhattanville & St. Nicholas Avenue Railway stock as the petitioner may purchase.

Western Ohio Railway, Lima, Ohio.—A syndicate headed by William Salomon & Company, New York, N. Y., has purchased $1,500,000 of Western Ohio Railway 5 per cent first mortgage bonds, due 1921. The bonds were not purchased from the railway company, but have been deposited by their various owners with a committee of Cleveland bankers for eighteen months pending the sale of the entire lot to a distributing syndicate. The Western Ohio Railway is leased to the Western Ohio Railroad on the basis of payment of principal and interest on its $3,500,000 of 5 per cent bonds, dividends on its first and second preferred stocks and $15,000 annually. Stone & Webster, Boston, Mass., recently completed a report on the property.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 75 cents.

Chicago (Ill.) Elevated Railways, quarterly, 1½ per cent, preferred.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

Citizens' Traction Company, Pittsburgh, Pa., $1.50.

Columbus (Ohio) Railway, quarterly, 1¼ per cent, common.

Washington Railway & Electric Company, Washington, D. C., 2½ per cent, preferred, quarterly, 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period			Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
AMERICAN RAILWAYS							
1 m.,	Apr.,	'12	$374,240	.....	.....	.....	.....
1 "	"	'11	355,927	.....	.....	.....	.....
BANGOR RAILWAY & ELECTRIC COMPANY							
1 m.,	Mar.,	'12	$52,319	*$25,851	$26,468	$16,497	$9,971
1 "	"	'11	43,146	*24,718	18,428	12,498	5,930
9 "	"	'12	488,750	*218,165	270,585	131,918	138,667
9 "	"	'11	440,553	*203,448	237,105	109,084	128,021
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY							
1 m.,	Mar.	'12	$492,601	*$290,439	$202,162	$110,522	$91,640
1 "	"	'11	455,032	*261,327	193,705	105,303	88,402
3 "	"	'12	1,517,367	*878,122	639,245	334,414	304,831
3 "	"	'11	1,351,837	*754,375	597,462	303,133	294,329
EAST ST. LOUIS & SUBURBAN COMPANY							
1 m.,	Mar.	'12	$201,018	*$109,901	$91,117	$48,646	$42,471
1 "	"	'11	176,892	*104,914	71,978	45,850	26,128
3 "	"	'12	577,863	*323,808	253,983	144,296	109,687
3 "	"	'11	534,296	*307,265	227,031	136,289	90,742
HOUGHTON (MICH.) COUNTY TRACTION COMPANY							
1 m.,	Mar.,	'12	$24,485	$14,352	$10,133	$5,227	$4,906
1 "	"	'11	24,090	14,085	10,005	5,177	4,828
12 "	"	'12	301,629	178,653	122,976	62,720	60,256
12 "	"	'11	304,863	181,897	122,965	63,195	59,870
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY							
1 m.,	Mar.,	'12	$42,610	*$31,427	$11,183	$14,487	$3,264
1 "	"	'11	37,046	*26,763	10,283	13,292	3,009
9 "	"	'12	455,271	*289,917	165,354	130,040	35,314
9 "	"	'11	396,278	*251,550	144,728	118,326	26,402
NORTHERN TEXAS ELECTRIC COMPANY							
1 m.,	Mar.	'12	$139,192	$75,067	$64,125	$20,846	$43,280
1 "	"	'11	142,938	79,317	63,621	20,315	42,907
12 "	"	'12	1,614,215	886,628	727,587	251,527	476,060
12 "	"	'11	1,491,232	833,316	657,916	210,931	446,985
PHILADELPHIA RAPID TRANSIT COMPANY							
1 m.,	Apr.,	'12	$1,903,909	$1,161,888	$742,021	$748,632	†$6,611
1 "	"	'11	1,824,174	1,107,448	716,726	735,689	†18,964
10 "	"	'12	18,665,571	11,476,566	7,189,005	7,403,297	†214,292
10 "	"	'11	17,656,090	10,877,032	6,779,057	7,327,456	†548,399
REPUBLIC RAILWAY & LIGHT COMPANY							
1 m.,	Mar.,	12	$206,172	$128,956	$77,216	$44,424	$32,792
1 "	"	'11	182,989	117,960	65,030	44,424	20,606
UNION RAILWAY GAS & ELECTRIC COMPANY							
1 m.,	Mar.	'12	$315,800	*$188,638	$127,162	$51,243	$55,919
1 "	"	'11	253,139	*147,294	106,145	59,782	46,363
3 "	"	'12	923,076	*551,177	371,899	202,390	169,509
3 "	"	'11	781,506	*458,439	323,067	178,601	144,466

*Includes taxes. †Deficit.

Traffic and Transportation

"Get Together" Meeting of the Employees of the Kokomo, Marion & Western Traction Company

More than 100 of the 125 employees of the Kokomo, Marion & Western Traction Company attended the recent quarterly "get together" meeting held in the hall of the Y. M. C. A. at Kokomo, Ind. T. C. McReynolds, general manager of the company, acted as toastmaster. Speeches were made by P. H. Palmer, assistant general manager, and Sam Humbert, of the company, and a paper, "Steps to Success," was read by G. W. Owens. Mr. Owens said that each person in the organization should do the task assigned to him as well as he knew how. No one could do it all. He likened the railway to an organ, saying that there were many keys and that one was just as important as another. When a false note was struck the harmony was destroyed. The success of the company depended upon the conduct of its employees.

George J. Marott, president of the company, was unable to be present, but sent a letter which was read at the meeting. This letter contained a contribution which was placed to the credit of the Employees' Voluntary Protective Association.

The protective association has been organized recently among the employees for their benefit in time of sickness, accident or death. The dues of the members of this association are proportioned according to the following schedule:

1. If salary is $45 or less, 35 cents monthly.
2. If salary is more than $45 and less than $65, 50 cents monthly.
3. If salary is more than $65 and less than $100, 75 cents monthly.
4. If salary is more than $100 and less than $150, $1 monthly.
5. If salary is more than $150 and less than $200, $1.50 monthly.

The benefits which are derived by the members of the association are as follows:

1. If in class 1, 55 cents a day for a period of 120 days.
2. If in class 2, 65 cents a day for a period of 120 days.
3. If in class 3, 80 cents a day for a period of 120 days.
4. If in class 4, $1 a day for a period of 120 days.
5. If in class 5, $1.25 a day for a period of 120 days.

Membership in this organization is voluntary on the part of the employees.

L. H. Moffitt was elected chairman to arrange for the next "get together" meeting.

In addition to the quarterly "get together" meeting, weekly meetings of the heads of departments of the company are held in the office of the general manager and committees which are appointed for a stated period inspect and report on power plant, car shops, offices, track, etc. Each man is penalized if he does not advance some new idea to the advantage of the company. The meetings are all held at the expense of the company. The quarterly meetings are preceded by a banquet.

The Development Policy of the Louisville & Northern Railway & Light Company.

Martin J. Insull, general manager of the Louisville & Northern Railway & Light Company, New Albany, Ind., which has been doing a great deal for the general development of southern Indiana opposite Louisville, a district through which the lines of the company run, said recently in regard to the advertising policy of the company:

"For the past few years we have been doing all we could to develop the communities which we serve on the north side of the Ohio River. We have spent a great deal of money to make such slogans as 'Take the Big Red Car,' 'Cool Off on Silver Hills,' 'Live on the North Side,' etc., household phrases to the inhabitants of Louisville. We have done these things in our efforts to develop our own business, but in developing that have we not helped to develop the business of 'the butcher, the baker and candlestick maker,' in all the communities on the North Side?

"The slogan 'Live on the North Side' was adopted not with the idea of effacing the individuality of any community, but to cover in one attractive phrase all the communities served by our corporation. In fact, invariably when this slogan is used attention is called to some, if not all, of the communities served by us—New Albany, Jeffersonville, Charleston, Sellersburg, Port Fulton, Howard Park, Midway, Silver Hills, etc. There seems to be no more reason why a New Albanian should take exception to New Albany being included under the general term of 'the North Side' than why a resident on Cherry Street should object to his particular street being referred to as a part of West Union or one on Silver Street should consider himself slighted when his particular locality is referred to as the East End. What we are endeavoring to do is to develop the North Side communities as a whole."

Increase in Wages Announced in Milwaukee

On May 15, 1912, J. D. Mortimer, president and general manager of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., had posted in the carhouses of the company the following communication addressed to the motormen and conductors announcing an increase in wages effective on June 1, 1912:

"All motormen and conductors in the service of the company on June 1, 1912, will receive a voluntary increase of 1 cent per hour in their present rates of pay. All men who enter the service of the company after June 1, 1912, will receive during the first year of their service 22 cents per hour. The wage schedule, effective on June 1, will accordingly be as follows:

Continuous Service.	In Service of Company June 1, 1912.	Entering Service After June 1, 1912.
	Cents per Hour	
First year	23	22
Second year	24	23
Third year	25	24
Four year	26	25
Fifth year	27	26
Sixth year	27	27

"This increase in rate of pay of our motormen and conductors is made in accordance with the long-established policy of paying our employees as high a rate of wage as, in our judgment, we can afford. This is the ninth wage increase since the year 1900, at which time the scale ran from 15 cents to 19 cents per hour.

"I ask your continuous and consistent co-operation in our effort to serve better the patrons of our system, and to that end again desire to impress upon you the necessity of courteous treatment of your passengers, strict obedience to the company's rules and regulations and the exertion of every possible effort to prevent accidents."

"Don'ts" for Passengers

Considerable publicity has been given, particularly in New England, to the following "don'ts" for passengers compiled by a conductor of the Connecticut Company and published originally in the New Britain *Herald* as part of a short interview in which the conductor related briefly some of his experiences with the traveling public:

"Don't hunch up in a corner and stick your feet on the seat.

"Don't stand on the rear platform and blow smoke into the car.

"Don't block the doorway.

"Don't bother the motorman.

"Don't forget to close the door.

"Don't think you are privileged if you are the only one on the car.

"Don't forget there are ladies present.

"Don't try to be funny at the conductor's expense.

"Don't wait until you get to the terminal to ask for a transfer.

"Don't forget that the conductor is a man."

Arbitration of Service Terms in Detroit

The employees of the Detroit (Mich.) United Railway announced on May 14, 1912, that they did not object to former Judge C. J. Reilly, who was selected by the company as its representative on the board of arbitration to settle the dispute regarding the hours of labor, but they have not yet officially accepted Judge Reilly.

F. W. Brooks, manager of the company, and W. D. Mahon, representing the men, have conferred several times. It is stated that the company has offered to increase wages, but desires the hours and the runs to remain as they are. This offer, it is said, would increase the pay of the new men from 23 to 25 cents an hour and for those who have been in the service for eighteen months or more from 29½ cents to 30 cents an hour. This schedule would be on the basis of a nine-hour day, the contract to continue for three years. An agreement on this point would render arbitration unnecessary.

Stepless Car Being Considered for Service in Detroit.—It is stated that the Detroit (Mich.) United Railway is investigating the advantages of the stepless car and that a stepless car will be placed in service as an experiment in Detroit.

Express Service Between Georgetown and Somerset, Md.—The Washington Railway & Electric Company, Washington, D. C., is operating express service on its line from Georgetown to Somerset, Md., in the morning and in the afternoon. The cars stop only at railroad crossings and at fire and safety stops.

Near Side Stops in Syracuse.—Changes which it is proposed to make in the traffic rules of the city of Syracuse, N. Y., will require street cars to stop before crossing intersecting streets instead of after crossing them and will require automobiles and other vehicles following street cars to stop back of the cars.

Remodeled Cars in Service on Louisville & Southern Indiana Road.—The Louisville & Southern Indiana Traction Company, New Albany, Ind., has put into use a number of open cars remodeled at the Jeffersonville (Ind.) shops of the American Car & Foundry Company. The cars have an aisle down the center and the entrance is at the rear, the running board having been done away with.

Attempt to Wreck Interurban Car.—An attempt was made to wreck an interurban car of the Northern Ohio Traction & Light Company, 12 miles north of Canton, Ohio, on the afternoon of May 8, 1912, by placing a tie across the track just beyond the summit of a hill where the motorman could not see it until he had started down grade. Although he did discover the obstruction, the motorman could not stop the car and it was thrown from the track but was only slightly damaged.

Change in Trolley-Steam Crossing Ordered in Illinois.—The Illinois Railroad & Warehouse Commission has ordered the Freeport Railway, Light & Power Company and the Rockford & Interurban Railway to install proper crossing frogs and to raise the trolley wires to the legal height at their intersection with the Chicago, Milwaukee & St. Paul Railway at Freeport, Ill. Heretofore the companies have been unable to agree upon a satisfactory form of contract for this work.

Boosters' Club Suspends for Summer.—The Boosters' Club, which is composed of the officials and employees of the public service companies of New Albany, Ind., including the Louisville & Northern Railway & Light Company and the Louisville & Southern Indiana Traction Company, has closed its active work until next September. The final meeting before the summer vacation was held on May 14, 1912. At this meeting J. S. Strattan, secretary of the Louisville & Northern Railway & Light Company, was elected president to serve for three months beginning Sept. 1. The presiding officers serve for three months.

Merit System Adopted by Hudson & Manhattan Railroad.—The Hudson & Manhattan Railroad, operating between New York and New Jersey under the Hudson River, has adopted the merit system to govern its employees in the operating department. Wilbur C. Fisk, vice-president and general manager of the company, in commenting on this change in the system of discipline, said: "It is expected that the system will encourage and stimulate all employees to co-operate heartily with officers of the company in matters pertaining to harmony, economy, safety and efficiency, thereby securing better service and increasing benefits, security and satisfaction to the public and to all."

Reduction in Freight Rates on Beebe Lines.—The Rochester, Syracuse & Eastern Railroad and the Syracuse, Lake Shore & Northern Railroad filed with the Public Service Commission of the Second District of New York recently new freight tariffs effective on May 1, 1912. They provide for material reductions in the rates on a long list of commodities between Syracuse and Rochester, Fulton and intermediate points. A tariff making similar reductions in rates has also been filed by the Auburn & Syracuse Electric Railroad, effective on May 25. A number of perishable commodities which are now rated as first-class freight will be carried at second-class rates. All of the railways mentioned are controlled by the Beebe Syndicate, with offices in Syracuse, N. Y.

Request to Prohibit Passengers from Riding on Running Board.—An officer representing the employees of one of the divisions of the Connecticut Company has sent a communication in part as follows to the Public Utilities Commission of Connecticut in regard to double steps on open cars ordered to be installed recently by the commission: "I am directed by my division to communicate with you in reference to an order issued by your honorable body directing the Connecticut Company to equip its passenger cars with double steps for public safety. This order I assume is mandatory in its nature. In view of the fact that the aforesaid company is complying with it, and that when carried into operation the danger to conductors has increased greatly, owing to their exposure to injury from passing vehicles, etc., the men feel that they should be protected in the efficient performance of their duty by your honorable body issuing an order prohibiting passengers from riding on the running boards of open cars."

East Cambridge Elevated Line Nearly Completed.—A new rapid transit line between Boston and Cambridge, Mass., will shortly be placed in operation by the Boston (Mass.) Elevated Railway. The line consists of a double-track elevated structure connecting the North Station with Lechmere Square, the total length approximating 1 mile. Surface-type cars will be operated over the new route between the Tremont Street subway and various points in Cambridge and Somerville. The company expects that the traffic conditions at the Sullivan Square elevated terminal will be relieved by the inauguration of the new service and that a reduction in running time between the Highland district of Somerville and the business center of Boston will be effected. At the North Station on Causeway Street, Boston, an important transfer point has been established and additional platform facilities have been built, including direct stairway connections between the midway of the North Station and the elevated and surface car platforms. The new line crosses the Charles River on the downstream face of the Charles River dam, over a reinforced concrete viaduct. An inspection trip by directors of the company was made on May 20.

New Folder of Twin City Rapid Transit Company.—The Twin City Rapid Transit Company, Minneapolis, Minn., has issued a folder announcing the new time card which went into effect on May 15, 1912. Owing to the discontinuance of Big Island Park it was necessary to change the routing of the express boat service which the company operates at Lake Minnetonka in connection with its electric train service from Minneapolis and St. Paul. Heretofore the express boat service was furnished over four routes with a special line of excursion boats from Excelsior dock station to Big Island Park. The new plan will include a through service from Wayzata at the northeast end of Lake Minnetonka to Zumbra Heights at the southwest end of the lake, with stops at the various points of interest along the route. The folder contains detailed information in regard to trains to the lake and describes the fleet of six fast express boats and the interesting features of the various suggested trips. Attention is also called to the reasonable fares by boat. Express boat trips which vary from one hour to five and one-half hours in length are suggested. A special baggage service over the electric railway and boat lines is furnished to the many summer patrons who occupy the cottage colonies which surround the lake. This baggage service connects with the trains at Excelsior docks and carries baggage to the points not reached by the trains. A map 7 in. x 11 in., which indicates the boat and rail routes plainly, has been included in the folder.

Personal Mention

Mr. T. D. Massee has resigned as purchasing agent of the Macon Railway & Light Company, Macon, Ga.

Mr. T. C. Collins has been appointed dispatcher of the Eastern Pennsylvania Railways, Pottsville, Pa.

Mr. E. Sterling will be in charge of two interurban divisions of the British Columbia Electric Railway, Vancouver, B. C.

Mr. J. C. Bell has resigned as division superintendent of the Eastern Pennsylvania Railways, Pottsville, Pa., to enter business for himself.

Mr. H. S. Cooper has established his office as permanent secretary of the Southwestern Electrical & Gas Association at 524 Slaughter Building, Dallas, Tex.

Mr. W. H. Elson has been appointed superintendent of two of the interurban divisions of the British Columbia Electric Railway, Ltd., Vancouver, B. C.

Mr. G. A. Bright, formerly chief clerk to the superintendent of railways of the Eastern Pennsylvania Railways, Pottsville, Pa., has been appointed trainmaster of the company.

Mr. J. B. Rannie has been appointed traffic agent of the British Columbia Electric Railway, Ltd., Vancouver, B. C., in charge of the company's system in Vancouver and suburbs.

Mr. Allan Purvis has been appointed manager of the interurban lines of the British Columbia Electric Railway, Ltd., Vancouver, B. C. The position of local manager of interurban divisions has been abolished.

Mr. L. E. Jacobson, who has been auditor of the Green Bay (Wis.) Traction Company and the Green Bay Gas & Electric Company, has been appointed auditor of the Northern Utilities Company, with headquarters at Dixon, Ill.

Mr. W. J. Massee, formerly president of the Macon Railway & Light Company, Central Georgia Power Company and the Central Georgia Transmission Company, Macon, Ga., is promoting the Georgia Public Service Corporation, which plans to go into the light and power business in Macon and to build street railway lines from Macon to East Macon, South Macon and Vineville.

Mr. Gerhard M. Dahl, street railway commissioner of Cleveland, Ohio, under Mayor Baehr and the first occupant of that office, will become associated with the Electric Bond & Share Company, New York, N. Y. Mr. Dahl went to Cleveland from Stevens Point, Wis., in 1906, and entered the practice of law which he continued until his appointment as street railway commissioner in 1910. He was succeeded in that office by Mr. Peter Witt under Mayor Baker and resumed the practice of his profession some months ago.

Mr. John J. Nolan, secretary and general manager of the Evansville (Ind.) Public Service Company, has been appointed general superintendent of the Evansville & Southern Indiana Traction Company, which includes the Evansville, Princeton & Vincennes Interurban Railway and the city street railway lines in Evansville. Mr. Nolan has been general manager of the Evansville Public Service Company for two years and will continue in that capacity for the present. The company furnishes steam heat and electric light and power in Evansville.

Mr. R. W. Levering has resigned as superintendent of the Lafayette division of the Fort Wayne & Northern Indiana Traction Company to take charge of the insurance business of his father, the late Frederic R. Levering. Mr. Levering was graduated from the Purdue University in 1908 with the degree of electrical engineer. His first position was with the Chicago, South Bend & Northern Indiana Railway at Michigan City. He next went to South Bend for the same company. Mr. Levering was appointed superintendent of the Lafayette division of the Fort Wayne & Northern Indiana Traction Company on April 1, 1911.

Mr. S. W. Huff, president of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., spoke on the evening of May 24, 1912, at Cornell University before the Sibley College Branch of the American Society of Mechanical Engineers on the early development of the electric railway. The address con-

sisted mainly of personal reminiscences covering the experimental period of electrification in the early '90's. During this period, which was shortly after Mr. Huff's graduation from Cornell, he was working as an electrician in electrical manufacturing shops and on street railways, so that his recollections cover the distinctly practical side of the early successes and failures which were so important in the establishment of the industry.

Mr. Robert Grinnell, who served under Capt. Robert McCulloch, president of the United Railways, St. Louis, Mo., has been appointed superintendent of traffic of the Mexico City Tramways, Mexico City, Mex., under Mr. Harro Harrsen, general manager. Mr. Grinnell is about thirty-five years old, and was graduated from the University of Michigan in 1899. He entered the employ of the Chicago (Ill.) City Railway in 1900 as an armature winder, and served later as machinist, car repair man, lineman, fireman, station electrician, timetable clerk, assistant division superintendent, division superintendent, chief claim agent, superintendent of employment, chief supervisor and assistant general superintendent, resigning in 1908 to enter the service of the Illinois Tunnel Company as superintendent of motive power. He was promoted by this company the following year, but resigned in 1909 to take service under Mr. M. B. Starring, of the Northwestern Elevated Railroad, Chicago, Ill., on traffic problems. While he was with the Chicago City Railway Mr. Grinnell served under Capt. Robert McCulloch.

Mr. William H. Felton has been formally elected president of the Macon Railway & Light Company, the Central Georgia Power Company and the Macon Gas Company, Macon, Ga., in accordance with the plan to which reference was made in the Electric Railway Journal of May 18, 1912. Mr. Felton is fifty-two years old. For sixteen years he has been judge of the Superior Court of the Macon Circuit and he has been a practising lawyer for thirty years. He was graduated from the literary department of Mercer University and was graduated in law from the University of Virginia. At the time of his appointment to the bench he was a director of the Georgia, Southern & Florida Railway. He was a director of the Macon Gas Company for a number of years and chairman of the board of directors and chairman of the finance committee of that company. He is at present one of the trustees of the Georgia State Institute for the Education of the Blind, and as judge of the Superior Court was for a number of years ex officio a member of the Board of Education of Bibb County. He is one of the trustees of the Macon Free School Board, and for many years previous to the discharge of its bonded indebtedness he was one of the bond commissioners of Macon.

OBITUARY

John P. Barr, vice-president of the Slippery Rock & Grove City Railway, Slippery Rock, Pa., is dead. Mr. Barr was born in Venango County, Pa., and after serving in the Civil War he studied law and was admitted to the bar. In 1886 he removed to Grove City and organized the Union Heat & Light Company. He was a director of the Grove City National Bank.

Sir Julius Wernher, of Wernher, Beit & Company, London, Eng., died in London on May 21, 1912. Sir Julius was born in Darmstadt in 1850 and was made a baronet by Edward VII in 1905. For more than forty years he and Alfred Beit were prominent in the South African diamond market. In addition Sir Julius and Mr. Beit were interested in railway development and controlled a number of foreign electric railways, the most important perhaps being the Mexico Electric Tramways, Ltd., Mexico City, Mex., which they disposed of several years ago.

H. Holton Wood, Brookline, Mass., is dead. Mr. Wood was born in Montreal, Canada, in 1859 and was graduated from McGill University. He became interested in electrical development in Wisconsin. In 1883 he assumed the management of the Staten Island Transit Company. Later he purchased an interest in the Derby (Conn.) Street Railway. He was vice-president of the Derby Street Railway and superintended the construction of the road and later was elected president of the company, a position he held until the property was sold to the Connecticut Railway & Lighting Company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Eastern Illinois & Peoria Railroad, Chicago, Ill.**—Incorporated in Illinois to build a steam or electric railway between St. Elmo and Peoria. Headquarters, Chicago. Incorporators and directors: Frank R. Austin, Evansville, Ind.; Robert A. Dennis, Kenneth L. Richmond, Frank G. Nicholson and Fred W. Krohn, Chicago, Ill.

***Fort Wayne Union Traction Company, Fort Wayne, Ind.**—Application for a charter has been made in Indiana by this company to build an electric railway through the counties of Whitley, Noble, Elkhart, St. Joseph, Lagrange, Kosciusko, Marshall, Starke, Laporte, Porter, Lake, Fulton, Huntington, Grant, Madison, Tipton, Hamilton, Marion, Adams, DeKalb and Allen. Headquarters, Fort Wayne. Capital stock, $10,000. Directors: Henry M. Williams, Gottlieb Haller, Henry F. Beverforden, William P. Walsh and George Esmond.

***Multnomah Central Railway, Portland, Ore.**—Chartered in Oregon to build a 24-mile electric railway from Cottrell, on the Mount Hood line of the Portland Light & Power Company, to the base of Mount Hood, near Welch Place. Officers: E. R. Ernsberger, superintendent of the Mount Hood Railway & Power Company, Portland, president; G. A. Lovejoy, vice-president; W. J. Conday, Chicago, secretary, and W. D. Van Kuren, Philadelphia, treasurer.

***St. Albans & Swanton Traction Company, St. Albans, Vt.**—Incorporated in Vermont as the successor to the St. Albans Street Railway, the property of which was sold under foreclosure recently. Officers: John W. Ogden, Malden, Mass., president; Fuller C. Smith, St. Albans, vice-president; H. C. Royce, St. Albans, secretary; Walter R. Dame, Clinton, Mass., treasurer.

***Washington Western Railway, Three Lakes, Wash.**—Application for a charter has been made by this company in Washington to build an electric or steam railway from some tidewater point on Puget Sound into Snohomish County, via Three Lakes. Capital stock, $250,000. Incorporators: C. E. Clifford and J. M. Harnett.

FRANCHISES

Anaheim, Cal.—The Anaheim City & Interurban Railway will ask the Council for a franchise in Anaheim. This company will also ask for franchise to build through Orange and Santa Ana. The line will connect Anaheim, Fullerton, Orange, Santa Ana and Los Angeles. William Gerdes, Los Angeles Street, Anaheim, is interested. [E. R. J., May 4, '12.]

Berkeley, Cal.—The San Francisco, Oakland & San José Railway has received a franchise from the Supervisors for an extension north on Euclid Avenue, Berkeley.

Madera, Cal.—The Tidewater & Southern Railroad, Stockton, will ask for a franchise through F Street, in Madera.

***Pasadena, Cal.**—John MacDonald and William Easterbrook have asked the Council for a thirty-year franchise for a double-track electric railway on Lincoln Avenue in Pasadena. It is expected that the Pacific Electric Railway, Los Angeles, will build this line.

Richmond, Cal.—H. C. Cutting has received a fifty-year franchise from the Supervisors to build an electric railway along Cutting Boulevard and on the eastern boundary line of Richmond. [E. R. J., May 18, '12.]

San José, Cal.—The San José Terminal Railway has asked the Mayor and Council for a franchise over certain streets in San José. This is part of a plan to build a 12-mile electric railway between San José and Alviso, where it will connect with a fast line of steamers that will run to San Francisco. John A. Mehlin, San José, vice-president. [E. R. J., Dec. 9, '12.]

***Santa Barbara, Cal.**—George I. Cochran and George A. Batchelder, Santa Barbara, have asked the Council for a franchise to build an electric railway in Santa Barbara.

Louisville, Ky.—The fiscal court of Jefferson County has granted the Louisville & Interurban Railroad a right-of-way on the Shelbyville pike from the city limits of Louisville to Beechwood, a distance of 2½ miles, so as to enable the company to double-track its lines as far as the junction of its Lagrange and Shelbyville divisions.

Lynn, Mass.—The Bay State Street Railway, Boston, has asked the Council for a franchise to double-track on Summer Street, Lynn, from Boston Street to Little River bridge.

***Traverse City, Mich.**—Frank M. Garland, New York, N. Y., has asked the Council for a franchise for an electric railway in Traverse City. This is part of a plan to build an interurban railway to connect Traverse City, Charlevoix, Old Mission and points on the Leelanau peninsula.

Mount Iron, Minn.—The Mesaba Electric Railway, Duluth, has received a franchise from the Council in Mount Iron. The line will connect Hibbing, Chisholm, Buhl, Mount Iron, Virginia, Eveleth and Gilbert. Oscar Mitchell, Duluth, president. [E. R. J., April 13, '12.]

East St. Louis, Mo.—The East St. Louis & Suburban Railway will ask the Council for a franchise to extend its lines along St. Louis Avenue from Third Street to the eastern city limits in East St. Louis.

Bloomfield, N. J.—The Public Service Railway has asked the Council for a franchise to double-track Glenwood Avenue, Bloomfield.

East Syracuse, N. Y.—The East Side Traction Company, a subsidiary of the Syracuse Rapid Transit Company, has asked the Trustees for a franchise to double-track Manlius Street from the western line of Bridge Street to Ellis Street, in East Syracuse.

Lockport, N. Y.—The International Traction Company, Buffalo, has received a franchise from the Common Council to relay its tracks on East Avenue, in Lockport, with a 90-lb. groove rail.

Syracuse, N. Y.—The Syracuse Rapid Transit Company has received a franchise from the Common Council to extend its line to the city limits in Court Street, Syracuse.

Yorkville, N. Y.—The Utica & Mohawk Valley Railway has received a franchise from the Village Board in Yorkville.

Devil's Lake, N. D.—The Stotlar Investment Company, representing the Devil's Lake & Chautauqua Transfer Company, has received a twenty-five-year franchise from the Council in Devil's Lake. This company intends to bring the Chautauqua line into Devil's Lake.

Springfield, Ohio.—The Springfield, Troy & Piqua Traction Company will ask the Council for a franchise in Springfield.

Toronto, Ont.—The Toronto Railway has asked the provincial government for a franchise to double-track its lines on Bloor Street from Dundas Street to Pacific Avenue in Toronto.

Toronto, Ont.—The Toronto & Suburban Railway has asked the provincial government for a franchise to double-track several of its lines in Toronto.

Salem, Ore.—The Salem Street Railway has asked the Council for a franchise to extend its lines in Salem.

Bentleyville, Pa.—The Monongahela, Ellsworth & Washington Street Railway has received a franchise from the Council in Bentleyville. Charles S. Caldwell is interested. [E. R. J., April 27, '12.]

Pittsburgh, Pa.—The Pittsburgh Railways has received several franchises from the Council for the relief of the traffic in the district of Pentland, Ross and Tunnel Streets, Pittsburgh.

Scranton, Pa.—The Scranton Railway has received a franchise from the Council in Scranton to extend its tracks over certain streets in Scranton.

Westerly, R. I.—The Connecticut Company has asked the Council for a franchise for a line from Pleasant View to Weekapaug.

Milwaukee, Wis.—The Milwaukee Electric Railway & Light Company has received a franchise from the Council for lines on Thirty-eighth Street and Fortieth Street and Hillside Lane, with the stipulation that it shall extend its tracks on Eighth and Oklahoma Avenues in Milwaukee.

TRACK AND ROADWAY

Birmingham, Ensley & Bessemer Street Railway, Birmingham, Ala.—It is reported that this company will complete its railway from East Lake to Birmingham by July 1 and that the Bessemer extension will be built soon after; also that the extension to Tuscaloosa and another one to Gadsden will soon be constructed. The dummy line from Tuscaloosa to Holt is to be electrified. J. H. Morris, of Morris Brothers, bankers, Philadelphia, is interested.

Jonesboro & Nettleton Interurban Railroad, Jonesboro, Ark.—This company has been organized with a capital stock of $15,000 to build an electric railway between Jonesboro and Nettleton. Officers: Preston Hatcher, president; Thomas H. Allen, of the Allen Engineering Company, Memphis, vice-president; James B. Roleson, secretary, and A. L. Malone, treasurer. [E. R. J., April 20, '12.]

British Columbia Electric Railway, Vancouver, B. C.—This company has awarded the contract for the construction of its Nanaimo Street extension to the Franklin & Shepard Company, Vancouver.

Crescent City Railway, Riverside, Cal.—Work will soon be begun by this company on the extension between Riverside and Bloomington to Rialto.

San Diego (Cal.) Electric Railway.—This company plans to expend $100,000 for new and heavier rails to relay some of its lines in San Diego.

San Ramon Valley Railway, San Francisco, Cal.—This company advises that work has been begun on its railway to connect Walnut Creek, Alamo and Danville. Capital stock authorized, $250,000; issued, $250,000. Bonds authorized, $250,000; issued, $100,000. Officers: W. Armstem, 105 Montgomery Street, San Francisco, president; S. L. Naphtaly, San Francisco, vice-president, and H. A. Mitchell, 105 Montgomery Street, San Francisco, secretary and treasurer [E. R. J., April 27, '12.]

United Railroads, San Francisco, Cal.—Plans have been completed by this company for the extension from the terminus at the Southern Pacific station in San Mateo to a point 2 miles south in the Hayward Park district.

***Georgia Public Service Corporation, Macon, Ga.**—This company has been organized to build an electric railway and a lighting and power plant to furnish light and power in Macon, East Macon, South Macon and Vineville. The Scofield Engineering Company, Philadelphia, is the consulting engineer. W. J. Massee and J. T. Nynan, Macon, are interested.

Valdosta (Ga.) Street Railway.—Orders have been placed by this company for material to extend its line from Valdosta in two directions. The line to the east will extend as far as Forrest and through the northeastern part of Valdosta. The extension to the west will go as far as the old Georgia Southern depot to the northern part of Valdosta. It is announced that the company intends to build a belt line in both directions. Work will be begun about June 1.

Indianapolis, New Castle & Northeastern Traction Company, Indianapolis, Ind.—This company, the incorporation of which was noted in the ELECTRIC RAILWAY JOURNAL on March 23, 1912, has taken over from D. M. Parry, Indianapolis, Ind., and William E. Stevenson, Indianapolis, Ind., representing the bondholders, the Indianapolis, New Castle & Toledo Electric Railway, the property of which was sold under foreclosure some time ago.

Wichita Railroad & Light Company, Wichita, Kan.—Surveys are being made by this company from Halstead through Burrton to Hutchinson.

Louisiana Electric Railway & Power Company, Lafayette, La.—This company advises that it will not begin construction for several months on its railway to connect New Iberia, St. Martinsville, Breaux Bridge, Lafayette, Broussard, Youngsville and Abbeville. The company expects to furnish power for lighting purposes. A. G. Borrow, New Iberia, president. [E. R. J., April 20, '12.]

***Frederick & Brunswick Railroad, Brunswick, Md.**—It is reported that this company will be organized to build a 7-mile electric railway from Jefferson to Brunswick, connecting at Brunswick with the Frederick Railroad. Incorporators: F. B. Smith, G. Mantz Besant, Abraham Hemp,

Charles Wertheimer and Oscar B. Coblentz, all of Frederick, Md.

Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich.—This company has placed in operation its Paw Paw Lake division.

Toledo, Ann Arbor & Jackson Railroad, Monroe, Mich.—This company has resumed work on its line, and poles and rails have been laid as far as Petersburg, 11 miles. The line will connect Petersburg, Ann Arbor, Jackson and Toledo. L. E. Ingalls, Chicago, Ill., president. [E. R. J., Dec. 1, '11.]

Duluth (Minn.) Street Railway.—The citizens of Hermantown and of Proctor will furnish the right-of-way, if this company will extend its Piedmont Avenue line to these two suburbs of Duluth.

Kansas City, Lawrence & Topeka Electric Railway, Kansas City, Mo.—Construction will be begun soon by this company on its 24-mile line between Zarah and Lawrence. The line will be extended eventually to Topeka.

Billings (Mont.) Traction Company.—This company expects to build 6 miles of new track during the year. This line was placed in operation in April. Storage battery cars are used.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—This company is replacing 1 mile of track with 90-lb. girder rails.

Kingston (N. Y.) Consolidated Railroad.—This company is now rebuilding 1½ miles of track in Kingston.

Schenectady (N. Y.) Railway.—During the next two months this company will award contracts to build a 1-mile loop around the American Locomotive Works in Schenectady.

Syracuse, Watertown & St. Lawrence River Railroad, Syracuse, N. Y.—Bids have been received by this company for the construction of 6½ miles of its line from stop No. 9, on the Syracuse & South Bay Electric Railway, to Brewerton. Permission has been granted for the construction of this railway over the company's right-of-way by the Public Service Commission, and an extension will be made to Central Square as soon as permission is granted. This line will connect Syracuse, Watertown, Cicero and Brewerton. William Nottingham, Syracuse, is interested. [E. R. J., Aug. 19, '11.]

Charlotte (N. C.) Rapid Transit Company.—This company has awarded a contract to Tucker & Laxton Company for the construction of 2½ miles of track through the eastern part of Charlotte.

Stark-Summit Railroad, Alliance, Ohio.—Right-of-way has been secured and grading will be begun as soon as the surveys are completed on this railway to connect Alliance and Akron, via Marlboro, New Baltimore. It will touch the Northern Ohio Traction Company near Blue Pond. E. S. Cook, Alliance, is interested. [E. R. J., May 18, '12.]

Cleveland, Ohio.—The Cleveland & Youngstown Railroad has received a franchise from the Council to build a steam and electric railway along Kingsbury run in Cleveland to a point on Ontario Street where a large terminal has been planned. Work will be begun at once. John L. Cannon is interested. [E. R. J., April 20, '12.]

Columbus, Kenton & Toledo Traction Company, Kenton, Ohio.—Preliminary surveys are being made for this line between Findlay and Richwood, under the supervision of C. W. Wisell. From Richwood to Columbus another line will be used, and from Findlay to Toledo the Toledo, Bowling Green & Southern Traction Company's tracks will serve the same purpose. [E. R. J., May 18, '12.]

Springfield & Washington Railway, South Charleston, Ohio.—Financial arrangements are being made by this company for the construction of a 14-mile extension from South Charleston to Washington C. H.

***Wapakoneta, Ohio.**—Robert B. Anderson, Wapakoneta, announces that plans for an interurban line between Minster and Covington have been completed by John W. S. Reigle, Findlay. They will be submitted to the Public Utilities Commission and the commission will be asked to sanction a bond issue.

Ottawa (Ont.) Electric Railway.—Among the improvements planned by this company in the near future will be the connection of the Queen Street line and the Broad Street line, and an extension to Ottawa East as soon as a new bridge is built over the canal at Pretoria Avenue. The company is also considering the construction of a line on Laurier Avenue and the Lyons Street route in Ottawa.

Toronto Suburban Railway, Toronto Junction, Ont.—This company plans to extend its line from Bloor Street to Pacific Avenue and along Annette Street to Jane Street, in Ward Seven, Toronto. The construction of the extension to Woodbridge has been begun.

Portland, Eugene & Eastern Railway, Portland, Ore.—Right-of-way has been obtained and construction will be begun at once by this company on its line between Eugene and Monroe, to form a link of the through line between Eugene and Corvallis.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—Contracts will be awarded soon by this company for its 6-mile extension from Drexel Hill to Media, forming a link between the Sixty-ninth Street Terminal of the Market Street Elevated Railway, Philadelphia, and Media.

Levis (Que.) County Railway.—During the next six months this company will award contracts to build 1½ miles of extensions to its St. Romauld line, terminating in close proximity to the Quebec bridge now under construction.

Cumberland Valley & Interstate Electric Railway, Nashville, Tenn.—This company advises that preliminary work has been begun on its 80-mile line to connect Gallatin, Hartsville, Lafayette and Red Springs, Tenn., and Stamford, Ky. The company's power station will be located at Nashville and its repair shops at Gallatin. Capital stock authorized, $50,000. Officers: W. G. Schamberger, Gallatin, president and general manager; S. M. Young, Dixon Springs, vice-president; W. Y. Allen, Gallatin, secretary; P. H. Burnley, Hartsville, treasurer, and W. H. Sprodlin, Gallatin, electric engineer. [E. R. J., May 4, '12.]

El Paso (Tex.) Electric Railway.—Surveys have been begun by this company for its extension down Stanton Street between Boulevard and San Antonio Street in El Paso.

Greenville (Tex.) Traction Company.—This company plans to build a 2-mile extension through the neighborhood of the Dunean and Westervelt mills. This will be a spur track and not a belt line as previously planned.

Charlottesville & Albemarle Railway, Charlottesville, Va.—Plans are being made by this company for several improvements to its lines.

Highland Park & Lake Burien Railway, Seattle, Wash.—This company advises that its grading is completed and ties are laid on its 9-mile electric railway from Seattle to Lake Burien. It is expected to place this line in operation July 1. Power will be purchased from the Stone & Webster Company. Capital stock authorized, $125,000; issued, $125,000. W. H. Murphy, Seattle, president. [E. R. J., Feb. 24, '12.]

Spokane (Wash.) Traction Company.—Ballasting and improving the roadbed on the Riverview, Altamont and East Sprague lines in Spokane is being done by this company.

Clarksburg & Weston Electric Railway, Clarksburg, W. Va.—Bids are being received by this company for the construction of its line between Mount Clare and Weston.

Fairmont, Clarksburg & Grafton Railway, Clarksburg, W. Va.—Construction will soon be begun by this company on its electric railway between Fairmont, Clarksburg, Boothsville, Bridgeport and Grafton. Nearly all the right-of-way has been secured and most of the preliminary arrangements are completed. Charles F. Sutherland, Morgantown, president. [E. R. J., July 8, '12.]

Morgantown & Dunkard Valley Railroad, Morgantown, W. Va.—Surveys have just been completed by this company for its line between Pentress and Blacksville. This new route crosses Dunkard Creek at Pentress and proceeds to Blacksville on the opposite side of the creek. It is expected to begin construction of this line soon.

SHOPS AND BUILDINGS

Bangor Railway & Electric Company, Bangor, Maine.—Plans are being made by this company to build an extensive

addition to its carhouse on Main Street, Bangor. The cost is estimated to be $15,000.

Mesaba Electric Railway, Duluth, Minn.—This company has purchased a tract of land in Chisholm upon which it expects to build a new depot.

Helena Railway & Light Company, Helena, Mont.—During the year this company will build a new carhouse on Main Street in Helena. The cost is estimated to be about $25,000.

Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y.—This company has awarded the contract for the construction of its new terminal station in Oswego to Peter Raby, Oswego. [E. R. J., May 4, '12.]

Kittanning & Leechburg Street Railway, Kittanning, Pa.—This company has awarded the contract for the construction of its new carhouses in Garrett's Run to George Daugherty, Kittanning. The structures will be built of brick, concrete and iron. Work will be begun at once. The cost is estimated to be $15,000.

Phoenixville, Valley Forge & Stratford Street Railway, Phoenixville, Pa.—Work has been begun by this company on its new carhouse at Williams' Corner, Schuylkill. It will be 42 ft. x 110 ft. and contain three tracks, besides repair shops, etc.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—This company plans to build new stone stations at Brookline and at Drexel Hill.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—This company has completed its new carhouse in Hendersonville.

POWER HOUSES AND SUBSTATIONS

Georgia Public Service Corporation, Macon, Ga.—Orders have been placed by this company with the Allis-Chalmers Company for two turbines, one having a capacity of 1500 kw and the other with a capacity of 500 kw, with the necessary switchboards, exciter sets, condensers, etc. Contract for the boilers has been placed with the Erie City Iron Works and the plant will be in operation within three months. W. J. Massee, Macon, is interested.

Chicago & Joliet Electric Railway, Chicago, Ill.—This company has placed an order for two 500-kw two-unit, three-bearing motor-generator units, two 8-kw exciters, three 250-kva transformers and switchboard, with the General Electric Company.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.—This company is about to install two 300-kw rotary converters and six 100-kw transformers, which have been purchased from the General Electric Company.

International Railway, Buffalo, N. Y.—This company has placed in operation its new substation at Fillmore Avenue and Phelps Street in Buffalo. It has a capacity of 2000 kw.

Chautauqua Traction Company, Jamestown, N. Y.—This company is increasing the capacity of its station at Stow by adding a third rotary of 250 kw. An addition will be built to this power station.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—Plans and specifications are being made by this company for the construction of a new power plant on Fifteenth and Irving Streets in Olean. The structure will be 176 ft. x 160 ft. and of brick and concrete construction. There will be three Babcock & Wilcox boilers. The plant will have a 750-hp turbine in its first instalment with direct-connected generator and with space for second unit of same power to be installed within the year, together with space for other units as the development of the plant requires. The company has been authorized to spend the $250,000 by the New York Public Service Commission, Second District.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company has awarded the contract for its new power station at Lowellville to Stone & Webster, Boston, Mass.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—This company plans to enlarge its power house at Llanerch from 800-kw capacity to 1500-kw capacity.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—This company's new substation at Hendersonville has been completed and the equipment will be installed at once.

Manufactures and Supplies

ROLLING STOCK

Detroit (Mich.) United Railway has ordered one hundred double-truck city cars from the G. C. Kuhlman Car Company.

Paducah (Ky.) Traction Company intends to remodel all its cars for pre-payment operation. Several remodeled cars are already in service.

International Railway, Buffalo, N. Y., has ordered from the G. C. Kuhlman Car Company 100 near-side car bodies mounted on Brill 39-E trucks.

Bridgetown Tramways Company, Ltd., Bridgetown, Barbados, B. W. I., is in the market for twenty cars. W. R. Morrison, Mayer Building, Peoria, Ill., general manager.

Illinois Central Electric Railway, Canton, Ill., has ordered two 47-ft. 2½-in. passenger-baggage car bodies mounted on Brill 27-M.C.B.-2 trucks from the American Car Company.

El Paso (Tex.) Electric Railway has ordered six double-truck trail cars of Stone & Webster design, through Wendell & MacDuffie, New York, N. Y., from the St. Louis Car Company.

Cleveland (Ohio) Railway has been authorized by the Cleveland Council to expend $15,000 for couplers which will be needed when the company puts into operation the trail cars which it is now having built.

Southern Traction Company, Waco, Tex., has ordered four motor car bodies and four trail car bodies from the St. Louis Car Company. Motors and trailers will be of the same general construction and are of the steel post type. The bodies are 26 ft. 6 in. in length and the over-all measurement is 41 ft.

TRADE NOTES

Weber Chimney Company, Chicago, Ill., has moved its offices from 209 South State Street to 1452-1456 McCormick Building, Chicago.

William C. Wilson, associated with the sales department of the Transportation Utilities Company, New York, N. Y., has resigned from that company.

Midvale Steel Company, New York, N. Y., has moved its New York office from Twenty-sixth Street and Fifth Avenue to 50 Church Street, New York.

R. M. Campbell, for the past year identified with the Transportation Utilities Company, New York, N. Y., has resigned to become associated with the Industrial Efficiency Company, New York, in which he is financially interested.

Pressed Steel Car Company and Western Steel Car & Foundry Company, Pittsburgh, Pa., have appointed J. F. MacEnulty their general sales manager. Mr. MacEnulty will be located at 24 Broad Street, New York, N. Y., and will have charge of the sales department.

H. A. Goode, of Wonham, Sanger & Bates, New York, N. Y., sailed on the *Cedric* for England on May 18, 1912. Mr. Goode will remain in England for three months and will then sail for South America. He expects to remain in South America for nine months. His trip is in the interests of the export business of Wonham, Sanger & Bates.

Canadian Car & Foundry Company, Montreal, Que., will erect a plant at Fort William at a cost of about $1,000,000. Work will be begun next August, and employment will be given to 1000 men. The plant will have a capacity of 7000 wooden and steel cars a year. A site has already been obtained. The funds for the new plant, which will be the company's fourth, will be raised by an issue of bonds.

Hall Signal Company, New York, N. Y., through the reorganization committee, has notified the stockholders that the plan submitted to them by the committee on April 2, 1912, has been declared effective. An underwriting syndicate will be formed, and the plan put into effect. The committee has agreed with the underwriters to extend to June 6, 1912, the time in which deposits of securities under the reorganization can be made.

The J. G. Brill Company, Philadelphia, Pa., has received an order from the Omaha & Council Bluffs Street Railway, Omaha, Neb., for thirty Brill 27-E-1 trucks and twenty Brill 39-E trucks, fitted with Anderson automatic slack

adjusters, for twenty-five new cars which this company is building in its shops at Omaha, Neb. The Anderson slack adjuster has been made standard on this road and will be applied to all brake equipments.

Southwark Foundry & Machine Company, Philadelphia, Pa., manufacturer of turbine engines, has been sold. The new directors are Alba B. Johnson, Samuel B. Vauclain, Holstein De Haven Bright, John P. Sykes, Reeves K. Johnson, Alba B. Johnson, Jr., Jacques L. Vauclain and Andrew C. Vauclain. The new officers are as follows: Holstein De Haven Bright, president; James H. Maloney, vice-president and treasurer, and Alfred C. Maule, secretary.

Standard Varnish Works, Chicago, Ill., have moved their general offices in New York from 29 Broadway to their new office building at Port Richmond, Staten Island, N. Y. Their new quarters will be in a new building 110 ft. by 45 ft. and four stories high. The first and second floors will be devoted entirely to office purposes. On the third floor there have been installed dining rooms for the employees and a complete printing and stationery department and janitor's quarters. The fourth floor has been fitted up and thoroughly equipped as a research laboratory.

Universal Railway Supply Company, Chicago, Ill., is the new name of the W. K. Kenly Company, Chicago. The change was made on May 1, 1912. The W. K. Kenly Company was organized in 1905 to sell light rail. In 1908 it started in the railway supply business, and although still prepared to sell light rail and its accessories, the company is now specializing in high-grade railway supplies, handling its own signal specialties and representing in the West the Kalamazoo Railway Supply Company, Kalamazoo, Mich. The officers and stockholders remain the same for the Universal Railway Supply Company as for the W. K. Kenly Company.

General Electric Company, Schenectady, N. Y., has received the following orders for railway equipment: Meridian Light & Railway Company, Meridian, Miss., six GE-80-A 40-hp two-motor car equipments; Washington Railway & Electric Company, Washington, D. C., eleven straight-air-brake equipments with CP-27 compressors; Virginia Railway & Power Company, Richmond, Va., six CP-27-A motor-driven air compressors; Citizens' Traction Company, Oil City, Pa., eight GE-210 50-hp two-motor car equipments; McGuire Cummings Manufacturing Company, Chicago, Ill., three GE-80 40-hp two-motor car equipments; Rockford (Ill.) City Traction Company, two GE-88 40-hp two-motor car equipments, fourteen GE-88 40-hp railway motors and one straight-air-brake equipment with CP-27 compressor; International Railway, Buffalo, N. Y., 100 single end straight-air-brake equipments with the CP-27 type air compressors; Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., five GE-214 75-hp four-motor car equipments.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has completed during the last four and a half months or is building rotaries the total capacity of which reaches 88,000 kw. For the past twelve months it is in excess of 200,000 kw. The figures bring the total capacity of Westinghouse rotary converter installations up to a figure of over 1,500,000 kw. The company is now building over 68,000 kw capacity of rotaries, each one being of 1000 kw or larger in size. An interesting features in connection with this item is the fact that 73 per cent of the above-mentioned capacity is intended for use on the electric railways in New York City. All of these orders carry with them the attendant complement of transformers. Some of the features which are augmenting the popularity of Westinghouse rotaries are the high overload capacity of the commutating-pole, railway-type rotary; the simple but effective brush-lifting device for lifting the direct-current brushes while starting the commutating-pole machines from the a.c. side; the use of Bronskol brushes on the a.c. collector rings; the mechanical oscillator, and the protection of all types with speed-limit devices. The Westinghouse Electric & Manufacturing Company also has developed the synchronous booster rotary converter, and the output of 70,000 kw of this apparatus—the only machines of this type ever built by any company—indicates very clearly the demand existing for this new type of variable voltage converter.

ADVERTISING LITERATURE

Duff Manufacturing Company, Pittsburgh, Pa., is mailing a circular in which attention is called to Barrett track jacks.

Bridgeport Brass Company, Bridgeport, Conn., is mailing a card which calls attention to the merits of phono-electric trolley wire.

Ackley Brake & Supply Company, New York, N. Y., has issued a booklet in which the Monarch refillable fuse is described and illustrated.

General Railway Signal Company, Rochester, N. Y., is distributing a loose-leaf binder in which new catalog sections, etc., issued by the company, may be filed. Catalog section J, part 2, which contains details of model 4A electric switch machine, accompanies the binder.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Booklet No. 111, in which the Duntley electric portable tools for direct and alternating currents are listed and illustrated. Circular No. 108 issued by the company illustrates several types of Rockford railway motor cars.

Uehling Instrument Company, Passaic, N. J., has issued a booklet which illustrates the standard styles of Uehling CO_2 and combined CO_2 and temperature machines, and the recorders and indicators used with them. The company has also issued the second edition of Bulletin 100, entitled "Combustion and the Cost of Power."

General Electric Company, Schenectady, N. Y., has issued Bulletin 4947, which is devoted to the subject of the illumination of electric railway cars and the advantages possessed by Edison Mazda and Gem lamps for this service. The bulletin contains illustrations which show the illumination of cars by these two types of lamps as compared with that which results from the use of the old carbon filament lamp. Bulletin No. 4939 is descriptive of electric hoists manufactured by the company.

Railway Improvement Company, New York, N. Y., has issued a booklet which shows the great extent to which the Hedley anti-climber has been adopted for all classes of electric railway service from the heaviest subway and elevated cars to light city rolling stock. The book contains many illustrations of these cars, of wrecks which might have been avoided by the use of the anti-climber and of car framing views which show how the anti-climber can be applied in new car construction.

Yale & Towne, New York, N. Y., have issued a new handbook on hoists. It contains illustrations and data which present all practical phases of hoist and trolley service. Diagrams and tables show efficiency, capacity, range, clearance, etc. Electric hoists and motor trolleys are illustrated in use. Installations for low ceilings are shown, with hand and power hoists of extreme compactness. Complete data are given on trolley track, turntables, two-way and three-way switches, with tables of costs.

Buda Company, Chicago, Ill., has issued a very complete illustrated catalog of its special track work, including frogs, switches, mates, crossings, standard and intricate layouts of all descriptions for street intersections, automatic spring boxes, anti-kickers, switch stands and track appliances. The company has extensive works at Harvey, Ill., a suburb of Chicago, and a view of these works is presented. New and special equipment has been installed in the plant at Harvey to replace or to supplement the old machinery, and the company is well equipped in its plant and with its facilities and new designs to meet the demands for special work imposed by the steadily increasing heavy equipment and severe traffic on electric railways.

Western Electric Company, New York, N. Y., has published the *Western Electric News* for May, 1912. The publication, of which this is the third number, is issued once a month for the employees of the company. Among the principal articles in the May issue are the following: "The Story of the Western Electric Company," by E. M. Barton, chairman board of directors; "Some Unique Manufacturing Methods," "Under Fire at Peking," "Untechnical Talks on Technical Topics" and "Opportunities with the Western Electric Company." Several pages are given up to news of the various branch houses of the company both here and in foreign countries. In addition there are departments devoted to athletics and humorous sayings.